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The **Farmer's Digest**

Volume 21 Dairy Issue, October 1957 Number 4

TEAMWORK . . . Key To a Good Breeding Record

It pays to cooperate with your artificial breeding technician . . .

Condensed from Hoard's Dairyman

H. A. Herman, Executive Sec. of Nat'l Ass'n of Artificial Breeders

THE inseminator uses the same semen for all herds. Why do some herds have many "repeat breeders" and some only a few?

The herds with a poor settling rate are either burdened by disease or are owned by dairymen who do not carry out their part of the responsibility in cooperating with the technician. Sometimes both situations apply to the herd. In fact, this is frequently true!

Often the disease problem is the more easily corrected.

If healthy cows are properly inseminated, with good quality semen, at the middle of the heat period to not over six hours after the end, 70 per cent of them will settle on the first service. Poor timing, often due to the cow not being observed and reported to the technician early, results in many cows returning for service.

Highest Paid Hours

Some of the highest paid working hours of a dairyman are those spent observing his herd, not only for evidence of cows in heat, but for detecting diseases and sickness in their early stages. It is surprising more time isn't spent in this apparently "lazy" but highly profitable phase of management.

Reprinted by permission from Hoard's Dairyman, Fort Atkinson, Wisconsin

A few cows fail to settle because they have an abnormal reproductive tract. This situation, however, doesn't account for more than 3 to 5 per cent.

There are extremes in poor nutrition, where nature pulls the switch, and cows fail to settle or to even come in heat. While feed is often blamed as a cause of breeding failure, reliable evidence indicates if a cow is properly fed for good health and milk production she has no further nutritive requirements for reproduction.

While we shouldn't discount the importance of disease in rendering cows non-fertile, it is increasingly apparent that man and his management sway the balance so far as results from artificial insemination are concerned.

Herd Owner Guides

The herd owner can help improve the breeding efficiency in his herd if he will:

1. Call the technician as soon as a cow is observed in heat. Tell him the hour she was first observed, choice of sire if selection is to be made, and whether or not she is a "repeat" cow.

2. Leave the cow in the barn and mark her by a string on the tail, note above the stanchion, or chalk mark on hip, as the cow to be inseminated.

3. Leave registration papers at an agreed place in the barn so the technician can identify the cow and complete the breeding receipt.

4. Leave check or money for the service at an agreed place.

5. Do not ask the technician to inseminate cows before 60 days following calving.

6. If you have a diseased cow, or a "shy breeder", do not blame the technician. Instead, provide veterinary treatment.

Technician "Headaches"

Here are some of the pet "gripes" of the technician:

Calls come in too late and a special trip is required.

Heat dates are not accurately reported.

Cow is not kept up; have to drive her up.

Cow to inseminate isn't marked.

Registration papers are not available.

Heifers not registered, and often are not identified.

Herd owner doesn't pay his bill.

No warm water.

Rueben Peterson, manager, Nebraska Dairy Breeders' Association, says: "The technician is just as interested in getting your cow in calf on the first service as you are. Any repeat calls he makes to your farm are at his own expense. Therefore, if he does not work efficiently he loses money. But repeats are not always due to the technician or the semen . . . your cow is exactly one-half the problem. Since you control the cow, your cooperation is necessary for good results."

How to Prevent Foot Rot

A veterinarian writes about one of the dairy cow's most common diseases . . .

Condensed from Jersey Journal

Jack W. Bailey, D.V.M.

ALTHOUGH it has been recognized as a serious disease for many years, the exact cause of foot rot of cattle is still unknown. In many cases it appears to be caused by a germ called Actinomyces necrophorus that sets up infection after entering the foot tissues through cuts and wounds. These germs live in all kinds of filth, including manure piles, swampy pastures, muddy lots and mudholes around tanks or ponds.

However, foot rot is often seen in pastured cattle during the dry summer months and in suckling calves that have never been in a barn lot. Such cases fail to support the theory that it is a filth-borne disease.

In addition, it seems definitely contagious in some outbreaks, which is also contrary to old ideas about foot rot. Accordingly, it appears that there may be more than one cause, and two or more types of foot rot affecting cattle.

Symptoms vary considerably, and cattle may appear lame before feet are suspected as being involved. Generally, though, a foot is badly swollen and the toes spread apart by the time an animal is noted as being lame. In advanced stages the foot becomes decayed and oozes pus, while constant pain causes affected cattle to lie down most of the time while losing weight at an alarming rate.

Twenty polled Hereford cattle—3 bulls and 17 heifers —were recently shipped by air from the U.S. to England, the home of the Hereford breed. Prices ranged from $500 to $19,000.

Many satisfactory treatments are known, for foot rot usually is not hard to control. Old methods consisted of soaking the feet in formalin or disinfectant solutions and the application of chemicals like copper sulfate and butter of antimony, followed by bandaging.

Reprinted by permission from Jersey Journal, The American Jersey Cattle Club, Columbus 5, O.

In recent years this type of treatment has been largely replaced by sulfa solutions given intravenously and intramuscular injection of antibiotics like penicillin and streptomycin. Sometimes both the old and new types of treatment are combined. When joints are badly damaged one of the toes may require amputation.

When several animals are affected and individual treatment isn't practical, owners sometimes treat the whole herd. This calls for building a watertight box a foot and a half wide, eight inches deep, and about ten feet long, using either metal, wood, or concrete.

This is placed in a narrow gate or doorway, and is filled about half full of a ten per cent copper sulfate solution. The animals are driven through it daily for about a week or until the feet are healthy again. Adding two or three gallons of white vinegar to the solution will aid in dissolving the copper sulfate in cold water. The solution should be changed whenever it becomes too dirty.

If someone tries to sell you a Holstein, make sure it's a cow and not a horse. Recently, a Holstein stallion named Hercules was imported into this country. Holstein horses have been bred for generations in Schleswig-Holstein for light harness work, riding and particularly jumping.

Regardless of the method used, the treatment of foot rot can be depended on to cost time for treatment and money for medicine, so preventive measures are highly practical and the following are recommended:

1. Keep hoofs properly trimmed to eliminate ingrown hoofs that encourage injuries and infection.

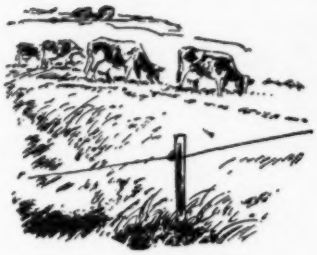
2. Do away with wet places in lots and pastures through drainage, fencing, or filling. Since rocks and cinders may cut feet, sand or concrete is preferred for filling jobs.

3. Keep stables clean and avoid the accumulation of mud and filth in barn yards and feed lots.

4. Secure a recommended organic iodine compound from your veterinarian and mix it with salt at the ratio of one pound to 50 lbs. of salt. This mixture is then fed free choice.

5. Make cattle walk through three or four inches of hydrated lime at least once daily. This can be done by using the trough already described for treatment and setting it up in an appropriate place. It can be made more effective by mixing five lbs. of powdered copper sulfate with every hundred pounds of the lime. The box will require occasional cleaning and the frequent addition of more lime.

$500 an Acre from Pasture



These farmers go heavy on manure and more fertilizer, even put nitrogen on legumes and make pasture the best paying crop on the farm . . .

Condensed from Farm Journal

Dick Braun

PUT nitrogen on a legume-grass pasture? Ridiculous!

Everyone knows that a legume makes all the nitrogen that it and the grass can use.

Or does it? Farmers who've tried putting extra nitrogen on their legume-grass mixtures say you get more and better feed.

Some scientists have been saying this for quite awhile. Back in March 1953 Missouri agronomist A. W. Klemme wrote: "I content that when we really get into high gear on this business of pasture yields, we'll find that legumes, at least the ones we now favor, *just won't supply enough nitrogen to get top production.*"

Other scientists now agree. Says Merle Teel, Purdue agronomist: "Growth depends on available nitrogen, and the grass can't always get all it needs from the legume."

Rodney Briggs, University of Minnesota: "Nitrogen on legume mixtures is *a new idea in meadow management,* and seldom recommended. But I've seen on farms what it can do."

On the more cautious side, M. B. Tesar, Michigan State, says: "Too much nitrogen can unbalance the mixture in favor of the grass. Annual top-dressings with 300 to 600 pounds of 0-10-30 or 0-20-20 per acre are recommended and profitable so long as legumes account for 40% or more of your stand."

One thing is certain. You can't feel safe about nitrogen just because there are some legumes in a mixture.

We know that legumes make good use of added nitrogen under some conditions. Agronomist Briggs points out these four — there may be others:

1. During the seedling stage
2. During spring growth when the weather is cold.
3. After the first cutting.
4. When the seed is not properly

Reprinted by permission from Farm Journal, Philadelphia, Pennsylvania

inoculated before being planted.

Three Hoosier farmers discovered first-hand what high-nitrogen fertilizer will do. In the process, they racked up barn-busting yields like these—8 to 10 tons of hay an acre; $528 worth of pork from an acre of pasture; and a net of $135 an acre with milk.

Don Rice, a Purdue student, farms with his dad in Posey County, Ind. They put on 500 pounds of 10-10-10 per acre and made 367 bales of alfalfa from a 1½-acre field in two cuttings. The bales weighed 70 pounds so *that's 8½ tons of alfalfa an acre and the third crop hailed out!*

A young stockman we know asked an old cattleman about the money to be made with sheep and received this answer. "Well, it's like they say. Sheep don't get sick. They just die."

Like many discoveries, this putting nitrogen on alfalfa came by accident. The year before, they had a few bags of 10-10-10 left over. Rice spread it on one corner of an alfalfa field. The surprising growth response whetted his curiosity. Now he knows that their alfalfa responds to nitrogen.

In Tippecanoe County, Ind., L. R. Miller has turned pastures into gold mines with hogs. He links high-nitrogen fertilizer with exceptional livestock and pasture management.

Miller rips up his pastures every year, and works in 400 pounds of 14-14-14. He *seeds heavy,* too —10 pounds of orchard grass, five pounds of alfalfa, three pounds of Ladino clover, 12 pounds of rape and two bushels of oats an acre.

The fast-growing oats gives early pasture. Rape takes over in late summer and fall. Orchard grass has fast regrowth, and legumes supply protein.

Does this mixture work? Let Miller's hogs answer that one.

Miller divided a 14-acre pasture into six lots with 15 sows and litters to a lot. Those 90 sows raised 630 pigs.

He left the pigs on creep feed for about 10 days after weaning. Then they lived on *pasture only* until they hit 100 pounds.

Figuring a 100-pound pig is worth $15, Miller had $9,450 worth of pigs from the 14-acre field.

His costs? About $787 in creep feed plus a $2 charge on each pig for sow feed. That leaves $7,403 *or $528 an acre for his overhead costs and labor.*

Putting it another way, he produced more than a ton of pork per acre on pasture *alone* from weaning to 100 pounds. And another ton from birth to weaning, with the help of sow's milk and creep feed.

Of course, finishing hogs that way takes more time, usually seven months. But the first 100 pounds doesn't cost much—less than a nickel a pound.

Dairy farmer Jim McGee, Hamilton County, Ind., puts on 200 pounds of 60% muriate of potash when he works up his pastures every five years. "After five years, grass loses its snap," he says. He top-dresses with 400 pounds of 0-20-20 after the second cutting.

McGee puts the nitrogen on with his manure spreader. Once in three years he spreads it "track to track" with the spreader wide open. Some parts of the field get three coats."

This, plus the fertilizer that his 70 Guernseys spread, adds up to lots of nitrogen "zing." It feels like a stack of carpets when you walk across his thick, heavy pastures.

Two 12-acre fields carry McGee's herd during the spring and summer. He pastures a field 30 days, then clips and rests it for 30. Three 12-acre fields grow the hay and furnish some off-season pasture. Dry cows and heifers live on a 10-acre "rested" pasture all winter. They get extra roughage from haystacks.

With that kind of management, McGee supports his herd on a 75-acre farm, all in alfalfa, Ladino, bromegrass and timothy. He buys the concentrate.

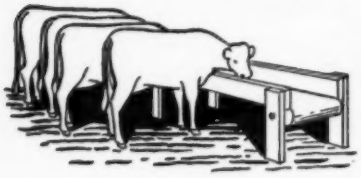
Last year the farm netted $135 an acre from milk, after he deducted the cost of concentrate and charged each cow $3 a month for pasture. (That's from 36 cows; doesn't include income from purebred calf sales.) It's good land—*the kind that sells for $400 an acre.* His last corn crop, five years ago, made 147 bushels an acre.

"It's what you net—not what you take in that counts," says McGee. He figures he can net more this way than with row crops. But here again, success hinges not only on pasture management, but on a livestock program that's geared to grass.

Pasture trials at Purdue University show that a daily milk production of more than 50 pounds per day per cow may be maintained from good pasture alone. In Illinois tests, one acre of good pasture was equal in feeding value to 3737 pounds of silage, 2017 pounds of hay, or 510 pounds of grain mixture.

With results like these farmers get, grass becomes more than a soil builder. It's their high-income crop. Sure, their results are spectacular. You may not be able to match them on your farm; but then you *might* do better.

Farmers Report on Loose Housing



Are calves healthy? How much space is required? Do you like it? North Dakota dairymen answer questions.

Condensed from The Farmer

Arthur H. Schulz, Extension Engineer

WANT to avoid making some mistakes in setting up a loose housing system for handling your dairy cows? If so, maybe you will find some advice worth following from North Dakota dairymen recently visited by the writer and Clarence Olson, North Dakota Agricultural College extension dairy specialist.

We asked questions about such things as loafing space, frosted teats, feeding in the open, or under cover, milking, parlor cleaning. In general all the farmers who have tried loose housing like the system.

Here are the answers to our specific questions about loafing space:

Most farmers thought that 60 square feet per cow was about right. Stanley Aarstad of Stutsman County who uses a remodeled 36 x 100-foot barn thought the figure could possibly be reduced to 50 square feet per cow with large herds and if all of the feeding was done outside.

A question on open door space was also asked. "Don't close off your loafing space or you will have a wet barn," was the word of caution we received from farmer after farmer. However they also thought the loafing barn should be deep and draft-free. William Conrad of Cass County, has just completed a new semi-open loafing shed so he can get his cows out of the old closed barn previously used as a loafing area. He built his new shed 42 feet deep to give plenty of draft-free space. The front was left open.

How much of the time can you feed outside?

The common answer was "All of the time except for very severe weather." Some protection from the north and west wind was desirable. A board fence, hay stack or other barrier will do the trick.

Protection from south winds was rated by some farmers as being almost as important as protection from the north wind. Kern

Reprinted by permission from The Farmer, St. Paul 2, Minnesota

Berg of Stutsman County has a board fence for north protection and stacks his hay to give protection from east winds. He says he would like a shed for hay but it would wait until he gets other improvements. He feeds outside all of the time and doesn't think the hay shed is the most important improvement needed.

James Strand of Traill County felt the same way. Rufus Kompak of Grand Forks County converted an old barn into a feeding barn to give some protection. Ogden Rose and Sons of Cass County built an open fronted hay shed and really likes feeding under cover.

When handling seeds, protect the life they contain. Never drop a seed bag.

After visiting with these farmers, it looked to us like some type of a covered feed barn that can be easily filled and self fed probably isn't needed for the beginner but ought to be included in long range plans.

What kind of waterer do you like best and should it be inside or outside?

J. P. Schlosser of Morton County in Central North Dakota has an electrically heated waterer located by a protective fence. His installation is the type preferred by most of the farmers. They like or wanted an electrically heated drinking fountain located outdoors, or better yet, located in a barn wall where it would be available for either inside or outside watering conditions.

James Strand waters inside now, but he would go outside if he had an automatic waterer. John Cameron of Cass County is watering inside but he thinks he should move the water outside to give him more loafing space for the larger herd he is planning.

Several farmers reported they had trouble with the cows freezing their teats when their waterer was in an open location. They reduced the problem materially by having water outside, but where the waterer was well protected.

Frosted teats were a problem on the Ernest Zickhur farm, La-Moure County. There was no more trouble when Mr. Zickhur moved the water tank in a corner of the barn.

From those queried about the frozen teat problem, we got these answers: In the herd of the Rose Brothers there was a report of one cow with an abnormally tight udder having a frosted teat. Estes Mathias reported: "I have to keep an eye on the weather or there is trouble especially from those cold south winds. Drying the udders after milking helps." The Stutsman County dairyman, Mr. Aarstad, gave much the same

report. Frozen teats appeared to be a problem that can be handled by drying the udder after milking, by holding the cows in the loafing area for 15 to 30 minutes after milking, and by confining cows with tight udders for a few days after calving.

Can the calves stand the cold as well as the cows? That was another question we asked.

Sam Lohr, another Cass County dairyman, said he was one of the "doubting Thomases" about loose housing before he tried it. He was advised to locate his calf pen in a protected part of his semi-open barn. He did. Now, he says, his calves are the healthiest he has ever raised. To keep his calves out of draughts he has a four-foot wall around them.

Cold Doesn't Hurt Calves

James Strand used part of the loafing area in his barn for calves but had to move them to an old poultry house to provide more room for his cows. He says the open loafing area would be his choice. Kern Berg calves out in his loafing area being careful to clean up carefully after calving. He said temperature was no problem. Keep the calves out of draft, get the manure pack in the calf pen started early in the fall and don't clean the calf pen during the winter seem to be the rules followed by most of the farmers.

Keeping the milking room or milking parlor clean is sometimes a problem so we asked how this could be done most easily. Mr. Berg and Mr. Aarstad had two of the cleanest milking parlors we have seen. Both kept their milking parlors clean by brushing the floor. Neither washed down the parlor during the winter months unless odors became a problem. This method of cleaning keeps the parlor both dry and clean. The dryness is particularly popular with the farmers as it eliminates the slippery condition on the floor and also makes it easier to clean up spilled feed and similar wastes. Not all milk inspectors will permit this type of cleaning but Del Hanson, Fargo Milk Inspector, recommends it whereever keeping the parlor dry may be a problem. All of the farmers found they had to wash the milkroom daily.

Total number of bulk tanks on U. S. dairy farms has roughly doubled each year since about 1950. Fifty-eight per cent of these tanks are in the 200 and 300 gallon size.

Practically all of the recent remodeling of dairy units in North Dakota have been to loose housing. Loose housing is not the solution of all dairy management problems but the farmers we visited like it.

How To Time Breeding For Good Conception

Some dairymen get 90% of their cows bred with the first service, others only 50%. In this article, an artificial breeding authority tells you why . . .

Condensed from The Cooperator

Vincent G. Hinkley,
New York Artificial Breeders' Cooperative

FOR THE most part, our breeding cooperative members are doing very well in observing cows that are in standing heat and reporting them to their technician at the proper time (in most cases before 10 a.m.). This allows the technician ample time to plan his route for minimum travel and most efficient service. If this were not true, my guess would be that the average member would not be enjoying the high quality service that he has experienced over the past few years.

For more than six years, better than 72% of the cows inseminated have been settling to one service, (60-90 day non-return basis) and most of those that return settle on the second service, leaving only a few that return for a third or subsequent service.

This does not necessarily mean that every herd has seven out of ten cows settling to the first insemination. In any dairy county, we can find a wide range in conception which you probably realize from talking with your neighbors. If we random select a group of herds, each of which have ten or more cows inseminated, we would expect a range of from 50% to 90% in conception. In other words, we find in some herds that every other cow is settling on first service while the next door neighbor has only one return from ten.

Questions Raised

The owner who gets a 50% conception rate is not satisfied nor is the technician who serves that herd. Because of economic reasons, both the technician and herd owner are quite concerned about

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a low rate of conception. At a time like this, the member is most apt first to place the blame on the inseminator's technique or the quality of semen produced. The inseminator probably begins to wonder if there is: (1) disease in the herd, or (2) if the cows are bred back too soon after calving, or (3) if the member is detecting heat at the wrong stage.

It is good to investigate all the possibilities. If your technician has had several years of experience and if a majority of your neighbor's herds seem to be settling satisfactorily, one should look for other possible causes. If there are indications of disease, the local veterinarians may be able to prescribe a remedy. If it isn't disease and if cows are inseminated less than sixty days after calving or if cows are not checked for standing heat carefully enough, don't make the mistake of blaming your technician, the semen, or your cows.

Chimps are the cleverest of all animals, British biologists say. The difference between them and the next cleverest apes or monkeys is as great as that between a 5 year old child and a college professor. Next in line when it comes to IQ are cats and dogs. Pigs are dumb but horses are still dumber; elephants have a very poor memory and ants are lazy, researchers say. —From Dagens Nyheter, Stockholm.

When to Breed After Calving

Almost everyone can remember individual cases where cows have settled 30 days after calving. It is an exception, not the rule. According to Professor George Trimberger's study in the Cornell herd, it is obviously unwise to breed cows sooner than 50 days after calving. A group of 26 cows bred an average of 40.9 days after calving required an average of 100.5 days after calving to become pregnant. Another group of 24 cows bred an average of 55.2 days after calving required an average of 74.5 days after calving to become pregnant. You gain most by waiting.

A dairyman may want to have some of the herd freshen earlier than the previous year. It can be done by applying good common sense. The Trimberger study indicates a right and a wrong way to do it. Note that by waiting an average of 15 days longer before first breeding the last group, they calved an average of 25 days earlier than the first group of 26 cows bred 40.9 days after calving.

Stage of Heat

I would like to call your attention to the simple diagram of the heat period listed on the accompanying chart. It shows *three* different stages of heat, but the per

cent of cows that conceive is highest when bred between the sixth hour and the end of standing heat.

The only sure way to check for standing heat is to turn the cow out with other cows. Some may be showing symptoms in the preheat stage as long as 12 hours (average—8 hours) before they will actually stand to be mounted. If one reports a cow for service at that stage, your technician may arrive at your farm during the first hour or two of standing heat, too early, and the best one could expect would be about 50% conception.

If you don't turn cows out for exercise, the cow may not be noticed until the latter part of standing heat. If reported then, your technician may be unable to get there until several hours after the end of heat, and there again we note a very abrupt drop in conception.

The chart is designed for the average cow which makes up a in dairy herds, but it may not apply to some individual cases. Also the various symptoms listed for high per cent of the individuals each stage are quite variable and should be considered as guides. The positive test of standing heat is when the cow stands to be mounted.

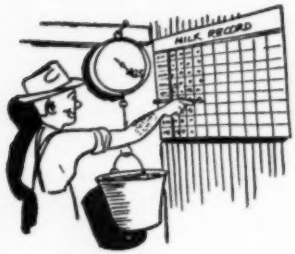
"Ha! That lecture I gave Dempster on marking the cow did some good!"

Call your technician when the cow is in standing heat and he will plan to inseminate her at the proper time for best results.

Time to Breed for Best Results

Coming Into Heat 8 Hrs.	Standing Heat 18 Hrs.	Going Out of Heat
1. Stands and bellows.	1. Stands to be ridden.	1. Will not stand to be ridden, but attempts to mount.
2. Smells other cows.	2. Bellows frequently.	2. Smells other cows.
3. Attempts to ride other cows, but will not stand.	3. Nervous and excitable.	3. May have clear mucus discharge from vulva.
4. Vulva moist, red and slightly swollen.	4. Rides other cows.	
5. May have clear mucus discharge from vulva.		

Six Ways You Can Boost Dairy Income



Don't wait for others to solve your problems. Here's how several top-notch dairy farmers are boosting income . . .

Condensed from Successful Farming

WHAT can you as a dairyman do about the cost-price squeeze — anything except holler? Strike? Turn to the government for help?

Look around! What you'll find may not be sensational, but there will be chances for a little trimming here and cutting there. All told, they'll help mightily in putting more spread between the cost of production and what you get for your milk.

Higher Production Per Cow

To many dairymen, getting more production per cow, with little or no extra cost, tops everything on the list. Jim Waldo and Walt Kirchner, until recently a 50-50 partnership between father-in-law and son-in-law, nearly doubled production per cow between 1949 and 1956 on their farm in Kenosha County, Wisconsin. These men scoured the countryside to get the best cows with production records. They paid up to $600 per cow, but their records convince them that it was the right move.

At first, Waldo and Kirchner did more culling than buying, so that between 1949 and 1951 the average herd size dropped from 38 down to 28. But, with 10 fewer cows, their total yearly production rose from 261,263 to 300,000 lbs. while average butterfat production climbed from 269 to 404 pounds. In the final year of their partnership, they had 46 cows, with a few of them occasionly giving up to 93 pounds of milk in one day. Yearly production then was just short of 500,000 pounds.

Looking Closer at Feed Costs

When the going gets tough, one of the first things a dairyman does is to take a squint at his feed bill. Maybe he can cut feed costs with little or no drop in production (too many just take a blind whack at cheapening their rations and hope for the best).

Paul Montavon, DeKalb Coun-

Reprinted by permission from Successful Farming, Des Moines, Iowa

ty, Illinois, already had a reputation for getting high production at relatively low feed cost. When profit margins narrowed he had to pull another trick out of the bag. He did it with roughage.

"Make their roughage so they will like it," advises Montavon. He's had his own bad experiences, like cows turning down second-cutting hay because it was made too late. Last year, Montavon cut his alfalfa-brome-Ladino hayfield in May—just as soon as he was through planting corn, and before cutting grass for silage.

Fertilized fish farms produce as much as 400 pounds of fish per year per acre. Some people claim they can produce more food per acre this way than by crop farming.

Montavon started when his hayfield was 1/10 in bloom, but it was half in bloom when he finished. That's something that everyone should remember—hay crops continue to mature, right while you're harvesting them.

To the part that went into the silo, Montavon added 150 pounds of ground ear corn per ton. He explained that he had to add grain to the ration somewhere along the line, anyhow.

Using D.H.I.A. records for a guide, Waldo and Kirchner found that feed cost and overhead rise with higher production, but that the returns from this extra production are much greater. For example, a cow producing 600 pounds of butterfat returns more than three times the profit made from a 400-pound cow.

Broer Immega, Walworth County, Wisconsin, sends representative samples of his corn, oats, and hay to a private laboratory for nutrient tests. He feels that the biggest savings in livestock farming can be made when you know what animals require to make milk or body weight. From time to time blood samples are taken to check for deficiencies in the animals.

Immega keeps close tab on prices of ingredients. In one instance, when the price of oats was low following harvest, Immega bought up a supply and shortly afterward, sold part of his corn, which was relatively higher priced. In the years when a bumper wheat crop is being harvested, Immega looks around for a good buy in bran, figuring that it may lighten the corn portion of his dairy ration.

Proper Handling of Dry Cows

Arden Baie, DeKalb County, Illinois, feeds no concentrates to his dry cows and bred heifers; instead, he gives them all of the grass silage and high-quality hay that they can eat. This, he says, has not cut production noticeably.

Another advantage is the production of a slightly smaller-size calf. He used to lose from one to two calves at birth every winter, but he hasn't had any difficulty since he adopted the feeding plan.

Better Utilization of Forage

The practice of strip-grazing is regarded as a cost-cutter by quite a few dairymen. Waldo and Kirchner ran 43 cows and 10 heifers on about one acre at a time. This was done by using an electrically charged wire to fence off one-sixth of the 30-acre field at a time and then another hot wire to cut off one-third of this long strip at a time.

Each day, the cross-wire was moved so that the cows could graze a fresh patch. After the third day, the cows started on the first third of another long strip, and a 15-foot lane running along one end of the entire field served as a route for driving the cows from one long strip to another.

The pioneers' Conestoga wagons were built higher at the ends to keep loads from spilling out on steep slopes.

Douglas Shanks, Lake County, Illinois, divided his 30-acre alfalfa-brome field into five 6-acre tracts and let 45 cows and heifers eat down one tract before turning them into the next. He said that, depending upon weather and growth rate, a 6-acre piece will last from 5 to 10 days. It takes about a half-hour to move the wire and drive the cows from one piece to another.

Fertilize Pastures

A growing percentage of dairymen have the idea that pastures should be fertilized just like any other crop—a concept that has been slow in taking hold because, every day, "the cows eat the evidence."

Waldo and Kirchner top-dressed their alfalfa with 400 pounds of 0-10-30 per acre, grazed it rotationally, and used the surplus for hay. They estimate fertilizer increased production by one-third.

Robert Nelson, LaPorte County, Indiana, spread 300 pounds of 0-10-30 per acre on his alfalfa-brome-Ladino-timothy pasture and hayfield, applying it in August or whenever he can find the time.

Likes Fall Freshening

Arden Baie feels that fall calving is best, all angles considered. By having the cows freshen in the fall he can sell his heavy production on a good market and then give the cows a pickup in the spring, toward the end of the lactation period.

He likes fall freshening, too, because the cows are dry in late summer, which lightens his milking chores when field work is demanding his time.

How To Keep Calves Healthy

A round-up of information about ailments generally considered "diseases of calves" . .

Condensed from Western Dairy Journal

Jim Flint

DEATH losses to calves during 1954 came to a staggering 2,500,000 animals. Of course, this includes beef as well as dairy. And it includes accidents and injuries. But the major cause was disease.

This article is a summary of health problems most commonly peculiar to calves, together with a number of accepted preventive and curative programs.

Calf Management

As with all animal health problems, specialists lead back to the same road—sound calf management—as being the key to any preventive or curative program.

Although the so-called "wonder drugs" are helpful, and often the only immediate curative solution, they alone cannot be expected to do the cleanup job.

Veterinarians constantly point to a "sound calf management program" as being the best means of reducing and somewhat controlling diseases among calves.

Such a program, they believe, should include: uncrowded conditions, clean bedding, fresh air without drafts, reasonably uniform temperature without sudden and wide changes, balanced and nutritive diet, use of medicants and vaccines only as recommended, removal of unsanitary and disease-breeding refuse and trash, and immediate isolation of infected animals.

And with calves, sound management must include proper care and nourishment to the dam, particularly during the last two months of the gestation period. Many a calf has failed to draw a breath, or has died within hours after birth due solely to the dam having been cut short on her rations. A balanced diet, containing sufficient minerals and vitamins plus other body-building nourishment, is necessary, authorities urge, or the calf will not have the initial strength with which to combat disease.

Calf Scours

Cause: Some causes are still

Reprinted by permission from Western Dairy Journal, Los Angeles, California

unknown. Various infections can be blamed, such as organisms of the coliform group, salmonella group and possibly viral agents. Research has indicated some scours may be caused by low blood sugar and low potassium level in the blood—a condition known as metabolic acidosis. And there is a condition known as dietetic scours. But, as Dr. M. G. Fincher of New York State Veterinary College at Cornell University points out, ". . . scours seems to be due largely to an overcrowded condition, poor hygiene, poor diet for the calves or for their dams, and to a variety of infectious agents, which may enter by ingestion, inhalation, or through the umbilical stump." Calf scours also is known as diarrhea in calves, calf septicemia and 3-day calf disease.

Agronomists say that grass-alfalfa mixtures produce more tonnage than either crop grown alone. Tests show that alfalfa alone produces 5700 pounds per acre; timothy alone, 1600 pounds. Together they made 6600 pounds.

Symptoms: Most fatal form appears at birth, or within 6 to 72 hours after birth. Calf appears cold, weak and in dying condition, may or may not have evidence of water feces. Appetite may become depraved. Middle ear joints and naval may become infected. *Acute Calf Septicemia* is the most serious form of scours. Calf starts showing white, or greenish-gray, offensive feces from 2 to 10 days after birth. Calves generally will continue to seek nourishment. Offensive and pussy discharges may come from the ears or navel. Arthritis or lameness may set in. Absence of temperature may mean rapid loss of body fluids in bringing on shock and complete dehydration.

Effect: Death is common. Many calves survive but some become unthrifty, stunted and may develop pneumonia. Can spread through the herd and wipe out a calf crop. May develop pneumonia or chronic diarrhea.

Treatment: Call a veterinarian. Much can be done with blood transfusions, modern antibiotics, protectants and other chemicals, but even a veterinarian may encounter trouble with an attack of scours because the cause could be from so many different things. Affected animals should be isolated immediately under clean, sanitary conditions.

Preventive Measures: As Dr. Fincher says, "Prevention of scours is not a simple matter." Specialists urge that a preventive program should begin with a properly balanced diet for the dam from 2 to 3 months before calving. This should include

feeds or supplements rich in Vitamin A and minerals. Treat naval of newborn calves with tincture of iodine. Do not crowd calves. Keep calves on clean, sanitary bedding, pasture or ground. Do not let calves overeat. Use first-milk (colostral). Keep calves away from any sick animals. Use good, vitamin-enriched calf starters. Have small amounts of fresh, clean water available, during the first two weeks. Don't let bedding, straw, feed or water become contaminated with feces and other coarse material. Open pen, nurse cow systems have been used effectively. Covered calf sheds, with sides opened as climate demands, have proved extremely helpful. Keep calves from sucking each other. Keep all feeding equipment clean.

Calf Pneumonia

Cause: Scientists differ as to cause. Some suggest cause it by one or more viruses. Others believe cause is from a bacteria. Environmental factors also can be the cause, such as improper housing. Chilling is extremely apt to cause pneumonia. Occurs frequently in calves that survive scours. In general, specialists feel that various infections and bad atmospheric conditions cause more of the serious outbreaks.

Symptoms: Generally affects calves after they are 3-weeks-old. Common at 6 to 8 weeks, but less frequent as calves become older. Even 4-month-old calves are not beyond getting pneumonia. Symptoms include dullness, coughing, rapid breathing and temperatures from 103 to 106 degrees. Nasal discharge may develop, as well as complete or partial loss of appetite. Calf loses condition rapidly, hair coat becomes rough and diarrhea develops. Prostration and death in a few hours or days may follow in acute cases. Often confused with a cold, particularly if it only is a mild attack.

Pneumonia often is blamed when actually the symptoms may indicate some other ailment. Blood poisoning, urea absorption or inhaling liquid into the lungs often confused with pneumonia. Rapid breathing might also indicate coccidiosis, lungworm disease, calf diptheria (foot-rot infecting mouth or throat) or leptospirosis. And lead poisoning also could induce a high temperature. Specialists recommend to always

The average cow now produces 6,000 pounds of milk. Production per cow in the U. S. has increased 20% in the last 10 years. A recent USDA report predicts that it will probably increase at least that much during the next 10 years. California's 8,600 lb. average is the highest.

suspect pneumonia in calves that display high temperatures and rapid breathing.

Effect: Death is not uncommon. Calves may develop poor conformation and poor growth rates. As mature cows, they may never come into the full production of their inherited potential.

A shipment of aphelinus—a small wasp-like parasite which attacks the spotted alfalfa aphid—has been released in New Mexico. The USDA imported the parasite from the middle east where it attacks aphids feeding on alfalfa. The aphelinus deposits its eggs inside the body of the aphid where they develop and eventually kill it.

Treatment: Most reliance has been placed on antibiotics or chemotherapeutic agents, such as sulfa drugs. However, overdosage in the sulfa drugs can and has caused deaths. Recommended to call a veterinarian if pneumonia is suspected, not only to learn the latest method of treatment, but to be sure no other disease or ailment is present.

Preventive Measures: Good sanitation is essential. Keep pens clean and dry. Quarters should be free of drafts. Diet should include vitamin-enriched calf starter, early-cut fine green hay, and clean water for calves not on nurse cows. Keep healthy calves away from sick cattle. Don't allow cattle recently trucked or shipped to be placed in contact with healthy calves for several weeks. Dr. Fincher comments that the most satisfactory results are by eliminating known causes, and that, "Until a vaccine, based on the viruses that may be involved in calf pneumonia, is produced, little can be expected or guaranteed from the use of immunizing agents.

Hemorrhagic Enteritis

Cause: Believed to be associated with overeating. Caused by an organism, Clostridium perfringens, or Clostridium welchii. It is a bleeding infection of the intestines.

Symptoms: In Canada and the West, resembles acute calf septicemia in that 2-week-old calves often are found dead without warning. May have colic, develop weakness and listlessness, quit nursing and pass bloody feces. A tendency toward rigidity, instead of paralysis, is an important sign. As the ailment becomes more severe, spasms occur, the neck is

The U. S. Forest Service now seeds clouds with silver iodide over forest lands to prevent lightning storms of a severe nature. These storms cause 49 per cent of the forest fires.

pulled back, and death follows within 2 to 24 hours. In the acute condition, temperatures seldom rise.

Effect: Death is common.

Treatment: Isolate the calves and call the veterinarian if suspected.

Preventive Measures: Do not allow calves to overeat. Maintain clean, sanitary surroundings. Practice sound herd and calf management. Separate sick from healthy animals. Vaccinating cows before they calve with an alum-precipitated killed culture of bacteria has been found useful.

Salmonella Infection

Cause: Caused by the Salmonella organism but infection does not occur unless calves are exhausted, starved or deprived of colostrum. First brought to light following an outbreak in California in 1954.

Symptoms: Usually found in calves 2 to 15 days old. Usually a brief period of fever, which may pass unnoticed, to be followed by sudden death. Passing of bloody or watery feces. Generally mistaken for calf scours. Has been mistaken for coccidiosis.

Effect: Usually death.

Treatment: Nothing is entirely satisfactory. Isolate the suspected animal and call the veterinarian immediately.

Preventive Measures: There is no vaccine. Best method is to insure calves under 2-weeks-old are handled properly, given the right amount and type of nourishment and feed colostral milk. Also, follow sound sanitary procedures.

Tetany

Causes: A dietary condition some specialists feel is caused by lack of magnesium in the blood. Others point to a lack of calcium and Vitamin E, as well as suspecting a lack of other vitamins.

A recent report from Iowa State College says increased farm mechanization is reducing the pheasant population in that state. A study on 1,500 acres shows that mechanization has reduced the nesting success of pheasants in hayfields from 20 per cent to 7 per cent. Fall pheasant numbers dropped from about 210 birds per section of land in 1940 to only 100 in 1954.

Calves that eat only milk are believed to be especially susceptible.

Symptoms: Stiffness and convulsions.

Effect: Loss of growth and possible death.

Treatment: Call the veterinarian. Sedatives may relieve convulsions. Use of vitamin or calcium injections under veterinarian guidance may help.

Preventive Measures: Insure that young calves get proper and balanced nourishment.

Buying a Bulk Milk Tank ?

Here's good advice if you are shifting to bulk handling . . .

Condensed from New Mexico News

E. E. Anderson, Extension Dairyman

THERE is no "best" bulk milk tank any more than there is a "best" automobile, tractor or other piece of machinery. However, there may be a certain type, style, shape or method of refrigeration that best suits your particular needs. In some cases, financing arrangements may limit your choice of a tank.

Apparently, the bulk tanks made by well-known manufacturers are doing satisfactory jobs. In most cases, reliability of dealer and quality of service available are more important than the type of tank. Before making a commitment, satisfy yourself that the dealer is reliable and equipped to give prompt and efficient service. The loss of only one tank of milk because of mechanical failure and inability to get prompt, efficient service may amount to more than the difference between the original cost of a higher-priced tank that you preferred over the one you bought.

Don't be misled by the high trade-in price some particular dealer is offering for your present cooling equipment. Used coolers have little value because of the rapid change-over to tanks that is taking place throughout the country. If an unusually high price is offered for your equipment, the dealer is either shaving his profit or has priced his tank high enough for a nice net profit on the deal.

Bulk tanks can be divided into direct - expansion and ice - bank machines. Either one may be of the vacuum type.

The ice-bank machines are similar in principle to your present can cooler. The refrigerating coils are in a reservoir of water where they make ice. Water is circulated over the ice and around the tank to cool the milk. This type of tank uses a smaller motor and compressor than the direct-expansion tank as a considerable period of time can be used in building up an ice bank.

In direct-expansion machines,

Reprinted from New Mexico News, New Mexico A & M College, State College, New Mexico

the refrigerating coils are in the wall of the tank and cool the milk as it comes into contact with the cold walls. So the machinery must be big enough to get rid of all heat taken from the milk while milk is being cooled. This type uses a motor and compressor about three times as large as those on ice-bank machines of the same capacity, but it does not have the separate small motor for water circulation.

Usually, a direct-expansion tank will use somewhat less electricity than an ice-bank machine, but it uses all of this power in a few hours of the day. Since the ice-bank compressor builds a bank of ice and the ice bank then cools the milk, the compressor does not need to run while the milk is being cooled. The ice-bank tank spreads its power over a much larger part of the day. The direct-expansion cooler requires heavier wiring and puts a much heavier load on the power line and the generating plant. This heavier load is put on the power line at a time of day when the line is already heavily loaded. This may or may not be important in your particular community. But before buying a tank, it's good business to find out whether your power supplier can deliver the amount of power you will need, when you need it. Also find out if the rate will be the same regardless of time of day that the power is used.

If all the milk produced in the U.S. this year was brought together it would make a river as wide as an ordinary highway and six feet deep that would stretch from New York to Los Angeles.

Refrigeration machines are cooled by water or air. It is a common practice to cool larger machines by water and small machines by air, but this practice is not always followed. Some machines are made for either water or air cooling. Water cooling is more expensive than air cooling because it requires plumbing connections, water supply and pump. In considering water cooling, make sure that you have enough water and that it isn't too hard or corrosive.

The refrigeration unit may be built into or a part of tank, or it may be a separate unit. If separate, it cannot be installed in the same room with the tank. In the latter case, experienced tank users recommend that this unit be protected only by a roof with openings on the sides for free air circulation.

In water cooling, the heat taken from the milk is dumped down the drain. In air cooling the heat taken from the milk is added to the air. When a part of a tank, air-cooled condensers are an ad-

vantage in the winter because this heat can be used to warm the milkhouse. This same advantage proves detrimental during the warmer months making especially good ventilation a necessity.

Before you buy a tank, check how it will fit in your present milkhouse or how your milkhouse can be remodeled at the least cost. Machines of the same capacity vary as to length, width, shape, and height. Remember too that you've got to get the tank through the door or else enlarge the present opening. Also consider height, width and shape for easy cleaning. Be sure to consult your health officer to make certain your milkhouse meets all requirements.

If your wife runs short of silver polish, tell her to use sour milk: Pour sour milk into a pan and put tarnished silverware into it. Let stand for several hours then wash the silverware in warm sudsy water. All the tarnish will be removed.

Probably all tanks now on the market meet the 3A sanitary standards. But, check to make certain. These standards are formulated by the International Association of Milk and Food Sanitarians, U. S. Public Health Service. Three A Standards largely concern materials of which a tank is made, insulation, and construction.

In converting to bulk handling, one problem is size of tank to purchase. Excess capacity is investment waste; too small a tank means costly replacement later. Most tank users agree that tank should be capable of holding one extra milking over the normal highest expected requirements, in case of a delay in pick-up. Some plants urge their patrons to provide excess capacity for two milkings. While bulk handling of milk is relatively new, many producers have a tendency to increase their volume after going to tanks. Therefore it is important that the tank you purchase be large enough to handle the greatest volume you are likely to need.

Freeze-Out Rodents

You can put the "freeze" on rats in your corn next winter if you have been using a forced air dryer, reports Bob Maddex, agricultural engineer. He says, some farmers around Michigan have found that running the dryer off and on during the winter makes it so uncomfortable for rats and other rodents they do little damage to the corn.

44 Steps to Hog Profits

Here are the studied recommendations of a symposium composed of 200 swine experts . . .

Condensed from
National Live Stock Producer

YOU can profit from a new farm "brain trust."

Better management ideas for hog raisers have been developed by the Nutrition Council of American Feed Mfgrs. Assn. working in cooperation with 200 USDA, Land Grant College and swine nutrition experts. These men have spent a year and a half of intensified study to develop a standard set of management recommendations which hog raisers everywhere should find helpful.

The first 21 recommendations are for the care of the sow and her litter; the remaining 23 steps offer tips on raising and caring for swine during breeding and gestation.

Here are these 44 steps to better hog profits.

Housing and Shelter

1. A farrowing house temperature of 55° to 65° F is recommended provided adequate ventilation is obtained.

2. Heat lamps placed in a corner, accessible only to pigs, are necessary when farrowing house temperature falls below 65° F. If a heat lamp of 250 watt size is used, it should be suspended approximately 24 in. above the bedding. Condition pigs to doing without the lamp by turning it off during warmer periods or by raising it.

3. Farrowing pens in a central farrowing house or individual farrowing houses should have a minimum size of 6 x 8 ft. for gilts and 8 x 8 ft. for sows.

4. Farrowing stalls or crates should have widths of 20 in. for gilts and 24 in. for sows; minimum lengths of 6 ft. for gilts and 7 ft. for sows. The space beneath the bottom board should be ½ the stall width. Minimum width on each side of the stall or crate for pigs up to 2 weeks is 18 in.

5. Guard rails 8 in. above the bedding and 8 in. from the wall are recommended in central far-

Just 100 years ago, seed catalogs listed tomatoes as annual ornamental flowers.

Reprinted by permission from National Live Stock Producer, 139 N. Clark St., Chicago, Illinois

rowing house pens and individual farrowing houses.

6. The farrowing pen or individual farrowing house should be lightly bedded with chopped or short straw or hay, shavings, ground corn cobs, bagasse, peanut hulls, cottonseed hulls, oat hulls, or other suitable bedding material. More liberal bedding may be used in unheated houses during cold weather provided it is short or fine material that will not interfere with the movements of the pigs.

7. Recommended shade area is 50 sq. ft. per gilt and litter and 60 sq. ft. per sow and litter.

Feeding and Watering

8. For self-feeding either in dry lot or in pasture, a minimum of one linear foot of self-feeder space or one self-feeder hole per sow or gilt and litter is recommended provided the young pigs have additional feeding space in a creep.

9. For hand-feeding in troughs, either in dry lot or on pasture, a minimum of 1½ linear feet of feeding space is recommended per sow or gilt and litter provided young pigs have additional feeding space in a creep.

10. For watering by automatic cup, provide at least one cup, not less than six inches in diameter or the equivalent, for each four sows or gilts and their litters. (An automatic waterer with two openings should be considered two cups.) For hand watering in troughs, provide at least 2 linear feet of trough space per sow or gilt and litter. Additional watering space may be required during warm weather in the summer.

11. Creep feeding beginning the first week is recommended. Five is the maximum number of pigs per linear foot of feeder space. The edge of the feeder trough should not be more than four inches above the ground or floor. A maximum of 40 pigs per creep may be allowed. Creep feeders should be placed close to a water supply and near the area where the sow is most of the time. They should be inside, in a well-lighted place in cool weather, and when placed outside in warm weather should be covered to provide shade and protection from rain.

The average American spends about 2½ hours each day earning money to pay his taxes—local, state and national, direct and hidden, to the tune of about 100 billion yearly.

General Management

12. When possible, the size of litters should be adjusted to the number of functioning teats or nursing ability of the sow. Transferring pigs from sow to sow should be done as early as pos-

sible. Three to four days after farrowing is usually the maximum length of time that this can be done, unless the odor of the pigs is masked, then it may be possible to transfer at a later time.

13. For large litters, pigs that are to be transferred, or when injuries to pigs or sows' teats are a problem, clipping needle teeth of pigs at birth or the first day is recommended. Only the tips of these teeth should be clipped.

14. Anemia in pigs farrowed in houses should be prevented beginning the first week by making clean soil or sod available, copperas solution on the sow's udder, individual iron pills, or other methods. This also may be necessary for pigs farrowed on pasture, when weather is unfavorable.

15. The age at which litters and sows may be run together should usually be two weeks, although small groups may be put together as early as one week. The age difference between such litters should not be more than one week in a central farrowing house or two weeks on pasture. The recommended number of sows with litters put together in a group is not more than four in a central farrowing house or six on pasture.

16. On good legume or legume-grass pasture, allow 6 to 8 sows or gilts and their litters per acre.

17. Castration of the pigs should be done during the first four weeks. It should not be done during the three weeks following cholera vaccination. Also, pigs weaned at four weeks or earlier should not be castrated within one week of the time of weaning.

18. Pigs should be protected from infection by worms as well as other diseases by good sanitation. Worming before weaning is not recommended and it should not be done within the three weeks after vaccination with living (virulent or modified) hog cholera virus.

19. Cholera, erysipelas and certain other diseases can limit other efforts toward efficient pork production. Therefore, veterinary medical advice should be sought with regard to proper methods of vaccination and other disease control measures.

In 1862, a naturalist watched one flock of passenger pigeons fly over—about 1 mile wide, and taking 80 hours to pass. He estimated the flight at 2½ billion birds. The species is now extinct, thanks to man's greed.

Weaning

20. Pigs may be successfully weaned at five to six weeks without the use of a sow's milk substitute when proper nutrition and management are practiced.

21. If pigs are to be weaned at five weeks or earlier, the follow-

ing conditions are recommended:

Age in Weeks	5	4	3	2	1
Minimum Pig Wt.—Lbs.	21	15	12	9	5
Farrowing House Temperature — °F.	60	65	70	75	75
Minimum Floor Space per Pig—Sq. Ft.	6	5	4	4	4
Maximum No. of Pigs per Linear Ft. of Feeder Space	4	4	4	5	5
Maximum No. of Pigs per Linear Ft. of Water Space	10	10	12	12	12
Maximum No. of Pigs per group	25	20	10	10	10

For early weaned pigs, housing that is warm, dry, and draft free is required. Supplemental heat such as heat lamp and special feeders and waterers are recommended.

Breeding and Gestation

22. Gilts to be retained for the breeding herd should be separated from the market herd at 4 to 5 months of age or at 150 to 175 pounds. They should have at least 12 well-developed teats.

The Federal Government employs more people than the nation's eight largest corporations combined.

23. Gilts should be at least 8 months old and weigh near 250 pounds before they are bred.

24. Worming of sows and gilts before they are bred is recommended and sanitary measures should be followed to prevent reinfection.

25. "Flushing" (increased feed intake) during the breeding season is recommended. The feed intake should be increased 7 to 10 days before breeding starts and maintained until all sows or gilts are bred.

26. With hand, or individual mating, two services per sow or gilt are recommended. The first mating on gilts should be on the first day of estrus and the first mating on sows on the second day of estrus. The second service should follow the first by 24 hours. (Note: When only one mating can be made during the estrus period, it is recommended that gilts and sows be served on the second day of estrus).

27. When weaning under two weeks of age, it is recommended that sows be bred on the second heat period after weaning. It is generally satisfactory to breed sows on the first heat period following weaning at three or more weeks.

28. It is recommended that gilts and sows be kept separate during the gestation period unless they are self-fed a bulky ration.

29. Effective mange and lice treatment is recommended during gestation.

30. Boars should be 8 months old before being used in the breeding herd.

31. Whenever practical, boars should be used to serve several sows or gilts outside the breeding herd prior to serving those in the breeding herd.

32. Boars of the same age or size can be run together during

the off-breeding season. Boars of different ages, junior and mature, should not be run together.

33. The recommended size of exercise lot for holding a boar is ¼ acre.

34. The maximum number of services per boar should be:

	Per Day	Per Week	Per Month
Mature Boar	3	12	40
Junior Boar	2	8	25

35. The use of a breeding crate is recommended when breeding gilts to old boars. It is often desirable to use a breeding crate when mating old sows to young boars.

36. Hand or individual mating of boars to sows or gilts is recommended over field mating. However, if field mating is practiced, two methods are recommended. One method is to split the sow or gilt herd so as to have one boar per group. Another method is to alternate boars in the sow or gilt herd; that is, use one boar or set of boars one day and other boar or set of boars the next day.

All China has only about 100 tractors—and practically no draft animals. The work is done by humans.

37. On good legume or legume-grass pasture, allow 10 to 12 gilts or 8 to 10 sows per acre.

38. The square feet of housing or shade per animal should be as follows:

	Winter (Housing)	Summer (Shade or Housing)
Gilt, or Junior Boar	15 sq. ft.	17 sq. ft.
Sow, or Mature Boar	18 sq. ft.	20 sq. ft.

39. Hand feeding of sows and gilts during gestation is generally recommended. Greater utilization of pasture and other desirable roughages can be attained and the condition of the sows and gilts can be more closely watched. especially adapted bulky rations can be successfully self-fed.

A chip on the shoulder usually indicates wood higher up.

40. When sows and gilts are self-fed during gestation, the number per linear foot of feeder space, or self-feeder hole, should be as follows: Pasture 3 to 4; Drylot 2 to 3.

41. For hand feeding in troughs of gilts and sows during gestation, or for hand watering, the linear feet of space required per gilt or sow is 1½ to 2 feet.

42. When alfalfa hay is fed in a rack, four sows may be fed per linear foot of rack space.

43. Bred sows and gilts may be used to glean corn left in the fields, providing an excessive amount of corn is not on the ground and supplement is available.

44. One automatic watering cup should be provided for each 12 gilts, or for each 10 sows. Additional watering space may be required during warm weather.

Artificial Breeding for Beef Herds

Here's how ranchers get more cows bred to their best bull . . .

Condensed from Western Farm Life

ARTIFICIAL insemination has long been a practice of dairy operators, but only recently has it been used in beef cattle herds. Some breeders of registered beef animals find it practical under their ranch setups. Tom Field, Hereford breeder of Gunnison, Colo., is making good use of the practice.

Field has a bull, U Royal Mixer 28, which he bred on his ranch and wanted to use more. By artificial insemination he gets more cows bred to this bull than would be possible by hand breeding.

After his cows calve on the home ranch they are taken to summer range — deeded land — more than 9000 feet in elevation. There the animals are put on irrigated pasture. The first pasture contains 320 acres. No bulls are allowed with the cows until all have been on pasture for six or seven weeks — the equivalent of two sexual cycles.

During this time all animals are artificially bred. After this preliminary breeding period is past the cows are divided into groups. Approximately 25 cows which are to be definitely bred to the bull are kept in a separate pasture and watched. They are not turned loose with the rest of the herd until they are safely bred artificially.

Last year, a second bull, HCR Silver Domino 12B, was used artificially in the herd. Picked cows are exposed to semen from this bull during the first six- to seven-week period.

At the end of the heavy breeding period the herd is divided into separate pastures with 50 cows and one bull in each. These "cleanup" bulls make sure as many cows as possible are bred.

Approximately 82 per cent of the cows in the herd of 250 are artificially settled. Prior to the insemination program an average of 57 per cent of the cows were hand bred and settled before cleanup breeding. Average calf crop on the ranch is 95 per cent.

Breeding season starts June 1 on the Field ranch. All artificial breeding is stopped the first of September and all bulls are taken

Reprinted by permission from Western Farm Life, P.O. Box 299, Denver 1, Colorado

from the herd October 15.

The artificial breeding program is under the supervision of Field's son, Fred. "This program keeps us on our toes," Fred explains. "You have to be with the cattle all the time. We keep records on about everything that can happen."

Records include any observations of abnormalties found in the cows, disposition of cows, bull semen, condition of semen diluter, source of diluter and the number of the cows and the bulls they are bred to.

A typical day starts at 5 a.m. Fred and Bill Gierhart ride the herd and pick up any cows ready for breeding. These animals are driven into a corral at summer camp headquarters. When the cows are corraled the boys clean and sterilize all inseminating equipment and collect the semen.

Semen is diluted and enough to inseminate the cows in the corral is taken out. The balance goes into a refrigerator. At about 6:30 the boys are inseminating the cows.

Animals collected that morning are kept in the corral during the day and inseminated again at 6 p.m.

After the cows are taken care of in the morning the two men are free to have their breakfast. After breakfast they take another ride through the herd looking for sick animals and additional cows to be bred. This job is completed at about 10 a.m.

During the hot part of the day, when the cows are settled down, fences are mended, irrigating is done, inseminating equipment used that morning is cleaned and sterilized and other normal ranch chores are performed.

At four in the afternoon another ride is taken through the herd. Cows picked up that night will be artificially inseminated along with those picked up earlier that day. The morning cows are then turned out and the evening cows kept in for a second treatment the following morning. At about 7:00 p.m. a final ride is taken through the herd.

"Inseminating the cows twice eliminates a lot of seconds," explains Fred. "A large per cent of the animals are settled the first time they are brought in. We use one cubic centimeter of the di-

"George" is the world's loneliest sheep. Three years ago, he toppled 200 feet off a rocky Tasmanian cliff and landed unhurt on a ledge. Ever since he has grazed grass growing on the 40 yard shelf and watered at a spring trickling from the cliff top. His owner has tried repeatedly to rescue him, but the ledge tucked under the cliff face, is inaccessible.

luted semen each time we treat the cows."

An average semen catch is five cubic centimeters. Semen is diluted at one to five ratio of semen to diluter. It is kept at a temperature of 40 degrees in a refrigerator. Most of the inseminating equipment is sterilized with dry heat in an oven. The balance is boiled.

"We have found some definite advantages in this program," Fred states. "An outstanding bull produces more offspring. Calves are grouped in closer age groups and there is better control of calving time, there is a definite improvement in breeding efficiency and the program is easier on bulls. Their life span is increased several years.

"Some of the disadvantages are that it takes an extra man. Extra time is required for care of equipment and the program itself is more expensive than a hand breeding program. It takes quite an investment in equipment."

"The extra expense is offset by the extra calves out of an outstanding bull. Kind of a neutral point is that hand breeding and artificial insemination both require being with the cattle constantly."

Treated Fence Posts Give Longer Service

Treating fence posts with preservative is hard work, but it pays off in longer-lasting fences, says Mike McNamee, Wyoming University extension agricultural engineer.

He suggests the "cold soaking" method as one of the easier ways to treat posts. This method is moderate in cost, and treated posts will last several years longer than untreated posts. Only materials and equipment needed are pentachlorophenol, a chemical compound called penta, and a tank to hold the posts and the chemical solution.

Ready-to-use penta solutions are available but McNamee says it's cheaper to buy penta concentrate and mix it with kerosene or light fuel oils. Carefully follow mixing directions on the label. One gallon of solution usually will treat 2-4 posts. Using penta reduces danger of fire.

A stock tank or three oil-drum halves welded together make an excellent horizontal tank. For upright tanks, weld oil drums together end to end. Wash out stock tanks thoroughly after use.

To treat the posts, place them in the tank and fasten them down. Add the penta solution and allow posts to soak at least 48 hours. Remove posts, drain, and dry them in a shady place. When the wood is dry enough to handle, it is ready to use.

—University of Wyoming

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Cleaned-In-Place Pipeline Milking

Pipeline milkers have come a long way to produce high quality milk and save labor . . .

Condensed from Nebraska Farmer

M. L. Mumgaard, Agricultural Engineer

THE successful dairyman tries to get the highest quality milk possible with the least amount of effort. Cleaned-in-place (C.I.P.) pipeline milkers can help produce both high quality milk and save labor.

The bulk milk tank with pipeline milking directly into the tank is an excellent combination. The increase in bulk tank installations will make the pipeline milker popular. Long pipelines can be used because they do not have to be dismantled to be cleaned. They can be used in either stall barns or milking parlors.

Pipeline milkers can reduce milking time about one-third in comparison to bucket units, but time saved will depend upon size of herd. Since the operator does not have to leave the milking area, he can give constant attention to the milking machine and do a better job of milking.

There are two types of pipelines, double line or loop and single line. They are also called pressure circulation and vacuum-gravity. During the milking operation they work identically, but the cleaning process is different.

The single line (vacuum-gravity) is used on short lines of 60 feet or less. The single pipeline is cleaned by flushing the cleaning solution back and forth by vacuum and gravity or by reversing the vacuum from one end of the line to the other.

The pressure system either uses a vacuum or a pressure pump to force the cleaning solution through the pipe loop. The milk pump which is used to pump the milk into the bulk tank can be used for cleaning or a separate pump can be installed.

A total of 734 herds or almost 45 per cent of all herds tested last year in the DHIA program averaged more than 400 pounds of butterfat.

The milk can be put into the bulk tank by three different methods. If the milk line is above the tank, a milk releaser can be

Reprinted by permission from Nebraska Farmer, Lincoln, Nebraska

used and the milk will flow by gravity into the tank. A vacuum bulk tank will pull the milk directly into the tank. A milk pump can pump the milk into the tank and also be used for cleaning.

C.I.P. cleaning can be simply the washing of the pipeline or can include teat cup units and all parts washed automatically by setting a timer and adding washing compound. As with all automatic devices, inspection of the job done is very important and some parts may need occasional hand cleaning. All equipment which is not cleaned in place must be disassembled, washed separately and stored properly.

C.I.P. pipelines require an adequate supply of hot water of good quality. The University of Wisconsin has found that pipelines require from one-fourth to two-thirds gallons of hot water per day for each foot of length. Vacuum-gravity or single line requires the least amount of hot water. Fast recovery electric or gas heaters will provide sufficient water. A 52 gallon electric with both heating units operating or an 80 gallon with one heating unit will also provide water for herds up to 50 cows.

The procedure for cleaning all milk pipelines after each milking should be:

a. Pre-rinse with fresh water at a temperature of approximately 100 degrees F. until the waste line runs clear.

b. Wash by circulating a suitable washing compound using temperatures, concentrations and time of circulation recommended by the washing compound manufacturer. The minimum time of circulation should be 15 minutes.

Every day, the United States loses some 2,000 forty-acre farms from wind and water erosion. The soil thus lost can never be replaced, and our population is growing by leaps and bounds.

c. Rinse free of all washing solution with clean hot water. (Water having temporary hardness should have rinse temperatures that will prevent film formation.) It is recommended that a water softener be installed when the water has over 12 grain hardness.

Just before milking all equipment and the pipeline should be sanitized. This is done by putting a chlorine solution through the pipeline.

C.I.P. pipeline milking will be successful if manufactured, installed and operated correctly. Before buying, it is wise to consult your milk sanitarian or county extension agent as they have information on materials, construction, installation, and suggested cleaning methods.

Dairymen Like the **WADAM** System

D.H.I.A. without butterfat testing locates the "boarders," guides feeding improvements . . .

Condensed from Prairie Farmer

DAIRYMEN throughout the nation are finding it easy to locate "freeloaders" in their herds by a simple method developed in Illinois called Weigh-a-Day-a-Month. It takes about 5 minutes and 5 cents a cow a month.

This simple record system was first used in Clinton county, Ill., in January of 1954. J. G. Cash, dairy specialist at the University of Illinois, had conceived the idea and developed the program. Farm Adviser Bert Sinclair offered to help find out how dairymen liked it.

Sinclair signed up 22 farmers who kept Weigh-a-Day-a-Month records for a year. They were the first farmers in the nation to use the program.

Today more than 160 Illinois herds are on WADAM in 22 counties. And now it's a national program of the agricultural extension service directed in the county by the farm adviser or county agent.

The importance of butterfat tests is not overlooked in this program even though WADAM is a record system of milk weights. Research at the University of Illinois indicates that milk weights alone are 90 per cent as effective as milk weights with butterfat tests for guiding herd improvement. The assumption is therefore made that cows with low milk yields are unprofitable regardless of their butterfat tests.

A rule of thumb for culling is to cull all cows of the high-testing breeds that produce less than 5,000 pounds of milk a year. Cull cows of low-testing breeds that produce less than 7,000 pounds.

WADAM is a way to determine monthly and yearly milk production of each cow by weighing milk just one day a month. Sam T. Steffen, a dairyman in Livingston county says, "It's the best way there is for a farmer to begin keeping dairy records."

Cash explains the program this way. You take the WADAM record sheet to the barn on the 15th day of each month. Weigh the milk from each cow at both milkings and record the weights on the sheet.

Reprinted by permission from Prairie Farmer, 1230 Washington Blvd., Chicago 7, Illinois

Also list any new cows in the herd, cows that have been sold, dry cows, and cows that have freshened. Then mail the sheet to the county farm adviser or county agent.

He will calculate monthly production and return a report to you. He will include a sheet of timely dairy information and record sheets for the next month. At the end of the year you will receive a summary of annual production.

With WADAM records, you can eliminate guesswork in culling "boarders," choosing cows to raise replacement calves, and feeding according to production. In short, it helps you know your cows better.

Farmers who live on the farm do not have to stop all work to receive Social Security benefits. They can work part time or thoughout the year and still receive all their payments providing they earn less than $1,200. If they earn more than $1,200, they lose one or more monthly payment.

Most cooperators have had the same experience as John Niemann of Clinton county, Ill. He says, "I always believed production records were a good thing, but I didn't feel I could afford DHIA."

"Since enrolling in the program, I have culled three cows and another is on the list to go. Even though I have culled on milk weights alone there has not been any drop in the factory-test in my 14-cow herd."

"After enrolling in WADAM, I found that I didn't know my cows as well as I thought I did. The one I thought was best because she gave a lot of milk when fresh finished the year with about 7,000 pounds of milk, and my herd average was more than 10,000 pounds."

Tests show the butterfat testing method used in bulk tanks is accurate if the milk is agitated long enough. Three minutes is the recommended length of agitation time.

On the other hand Elmer Kohrt of Livingston county says, "I found that my cows are better than I thought they were. I discovered one cow is producing more than 18,000 pounds a year."

These records are not official but their accuracy is surprising. For example, one cooperator in Clinton county had a WADAM herd average of 11,068 pounds of milk per cow. His milk sales were 10,600 pounds.

Milk for the family and milk fed to calves accounted for part of the difference. Even without

accounting for any of the milk, the difference is only 4.4 per cent.

WADAM also helps you feed grain efficiently. Dairy specialists at the University of Illinois recommended feeding one pound of grain for every 3 pounds of high-test milk (about 5 per cent butterfat). Or feed a pound of grain for every 4 pounds of low-test milk.

Most farmers on WADAM have simplified this rule by weighing the grain held by their feed scoop. Then they just feed a number of scoops of grain according to the monthly weight records.

See your county agent about Weigh-a-Day-a-Month in your county. You can begin keeping records. If the program isn't under way yet, your farm adviser or county agent will appreciate your interest, for he may be planning to start soon.

WADAM is still a relatively new program but it's "filling the bill" for many dairymen who have not been keeping records. It's a simple way to put a dairy herd on a sound business basis.

Good Management Results in Top-Notch Dairy Herd

A 500-pound butterfat production average per cow is possible for any farmer who practices careful dairy cattle selection and feeds the cows right.

Fred Krohn had 4 grade cows when he moved on to his 160-acre farm in Nicollet county, Minnesota, 13 years ago. Since then, he has built up a herd of 24 registered Holsteins that averaged 502 pounds of butterfat per cow during the past year, and 475 pounds the year before.

The state butterfat average is less than 250 pounds per cow. Dairy specialists estimate that at least 350 pounds is necessary to give a good return to the farmer.

Krohn's herd is mostly "home grown." He developed the herd by keeping cows that pay their way and getting rid of the "boarders." By 1949 he had 12 cows, 16 in 1953, and 21 a year ago.

He has been a full-fledged Dairy Herd Improvement association member since 1949. "DHIA records keep you cost conscious," he says. "They tell you exactly what each cow is producing, and which ones aren't paying their keep." As he tells it, he keeps cows "that stand up well in health and know enough to come in out of the rain." Some cows, he finds, are better doers and are able to take in more feed and produce more milk than others.

—University Farm and Home News

He Grows 80,000 Broilers in Spare Time

Using such labor-savers as bulk feed bins, conveyors, and tractor clean-outs; Robert Lahtinen is building a broiler business in his spare time . . .

Condensed from
Everybodys Poultry Magazine

Charles L. Stratton

YOU just don't start from scratch and become a top broiler grower unless there is a good reason for success.

Young Robert Lahtinen of Worcester County, Mass., is a conscientious broiler grower. He wouldn't have switched from being an independent to contract growing if prices hadn't hit the long slump. But four 20,500-bird flocks annually represent a big gamble, the way prices have been, so he made the change. Now a large integrated broiler growing concern points him out as one of their top growers.

Only four years ago he went into broilers, solely on the experience obtained while working on a poultry farm. He is also helping out in the family baking business operated by his father. But as he puts it, "I had time on my hands and wanted to get ahead." He started with a double-deck, 8500-bird house. "The first year was a low-profit year," he says. "But the next year was good, and that's when I expanded."

No high-priced custom job of building for this young poultryman. The lumber was logged off in the family woods and, with the help of a couple of carpenters, he and his father built the second building—a double-deck, 40x160-foot unit—in 10 weeks. Although he has capacity for more than 12,000 birds, he sticks to that figure. He firmly believes in allowing more than one square foot per bird and feels that you cannot get a better quality bird by crowding.

Makes Profit on Contract

Prices started downward and it wasn't quite as easy financially after he built the new house. Speaking about changing from independent to contract growing, he says, "Broilers have done well for me—but no business is profitable when prices are lower than costs." An integrated outfit

Reprinted by permission from Everybody's Poultry Magazine, Hanover, Pennsylvania

thought him good enough to take a chance on him. He continues. "I went on a standard penny-a-bird contract last October. The way prices turned out I should have done it earlier in August. But my books show that I don't have any worries at a penny a week per bird."

His in-town job requires real early morning work and occasional days away from home. His wife, Edna, and his father alternate in caring for the birds. His wife works right along with the birds when he is absent, tending water fountains, also stirring up

The United States produces 84% of the world's automobiles, 61% of its wheat, 61% of its machinery, 71% of its corn, and 75% of its steel.

the birds with a half dozen trips through the house during the day.

Lahtinen uses lightweight bottle gas brooder-hovers which throw a lot of heat, he says, and checking on birds is easy because the hovers are off the floor. His can be pulled up to the ceiling to eliminate storage problems. Brooders are hung down through the center of his pens, and he puts guard rings around each two hovers, except in the center of the pen. There three hovers are circled by one guard. He claims work is easier and he doesn't notice any difference whether two or more hovers are grouped together inside a single brooder guard.

No Lights First Week

The Lahtinens don't use night lights during the first week. "With bright lights on," he explains, "chicks sometimes become confused and cannot find the heat. In the dark, they are attracted to the heat by the glow from the pilot lights. After the first week, we leave lights on all the time."

Feeding is handled easily from strategically located bulk bins, using wheelbarrows. The first two or three days feed is placed on papers, then on the cardboard covers provided by the hatchery. Later on they change to regular hoppers — filling only one-third full to avoid waste, twice daily in the small house and only once daily in the large house, due to the larger number of feeders.

Cleaning out either building is easy, as they have wide end doors. A small garden tractor equipped with a scraper pushes the litter through openings in the second floor directly into a truck. A large tractor and scoop cleans up the ground floor. The job is easier since flocks in both houses are of different ages. With tractors and truck it only takes six hours to clean out either building.

Filling a house with fresh pine shavings takes three hours. Shavings are delivered in bulk, 20

cords at a time, and unloaded by a conveyor owned by the trucker. Lahtinen uses wheelbarrows to take the shavings from the conveyor and dump them into piles throughout the building for quick spreading.

Plan Full Time Operation

Immediate future plans call for gravel fill and grading in front of both buildings to make it easier for the processor's trucks at market time.

The Lahtinens new ranch-style home is a good 100 yards away from both chicken houses. "We like poultry," they say, "but we don't want them too close to the house. If we should ever decide to sell our home, the poultry buildings will not detract from the location."

Mr. and Mrs. Lahtinen intend turning their broiler growing program (the largest in their section) into a full-time instead of a sideline business. They do not intent to increase their flock size, but will devote all their time to make their broiler program even better. As Robert puts it, "Broilers have done well for us in the past and we expect to continue. When prices are right, we'll go independent again. Meanwhile, we'll raise on contract and keep it a going business."

Feed Each Cow According to Her Ability to Produce

In feeding dairy cows, it's the personal touch that tips the milk scales in your favor. You're traveling the road to efficiency when you feed each cow according to her ability to produce, Bill Northern, West Virginia extension dairyman explained.

"Cows differ in their need for feed," Northern says. "A good cow fed correctly uses about half her ration for maintenance, the other half to produce milk, Feed her too much and the extra nutrients go into body fat; feed her too little, and milk production suffers. You strike a happy medium when you feed in proportion to milk-producing ability."

The WEIGH-A-DAY-A-MONTH record-keeping plan gives you the production figures you need for correct feeding, Northern reminded. It's a simple, low-cost plan which helps in culling and in the selection of herd replacements, too.

"Ask your county agricultural agent about this new dairy record-keeping plan," Northern urged. "If you keep no production records now, the WADAM program is designed especially for you."

—West Virginia University

Why Bacterial Counts Are A Guide to Quality Milk

How the bacteriologist estimates the number and types of bacteria in milk and determines if the count is within the standard established by law.

Condensed from Certified Milk

FEW consumers realize the value of bacterial counts and essential laboratory tests in determining the quality of milk. For that matter, not many consumers understand that there are good and bad bacteria, what "counts" mean, how they are made, and when they are taken.

An explanation of the term "bacterial count" might begin with a definition of the word bacteria. According to Webster, bacteria are "a large widely distributed group of typically one-celled microorganisms, chiefly parasitic or saprophytic." Science has been able to classify these bacteria and determine which are objectionable in milk and which are not.

Bacterial counts, therefore, are tests which enable the bacteriologist to estimate the number and types of bacteria present in milk and to determine if the number is within a reasonable standard established by law.

Two Methods

There are two methods by which bacterial counts are made: the direct microscopic and/or the agar plate count. In an article by J. M. Jensen, these methods are described as follows: "The direct microscopic method requires the making of a smear (equivalent to 1/100 milliliter of milk) spread uniformly over a square-centimeter area. The milk is dried, defatted, and stained. Bacteria are counted in each area examined under a microscope.

"By examining milk under the microscope it's possible to distinguish the bacteria as to size and shape. This furnishes a clue to possible sources of contamination. These reports will usually refer to poor cooling, utensil contamination, mastitis and so forth. They should be considered as possible, rather than absolute reasons for indicated defects.

"Standard plate counts are made by causing bacteria in milk to grow on agar until visible colonies are produced. Milk is diluted to an extent necessary for

Reprinted by permission from Certified Milk, 405 Lexington Avenue, New York 17

a good distribution of colonies.

"Agar medium, containing nutrients required for growth of bacteria, is mixed with the diluted milk. Plates are incubated at 95 degrees and held for 48 hours, at which time growth-colonies are counted and the bacterial count determined."

As Jensen states, "Bacterial counts are far more sensitive measures of milk quality than are taste and odor. Tests have shown that bacterial counts in milk may range from 1.5 to 10 million per milliliter before the off-flavors caused by bacteria can be detected (there are 956 milliliters in one quart). Although the off-flavors are not detected at those levels, chemical tests showed that certain milk constituents are impaired."

The elderly tycoon, age 75, carried his 19-year-old bride over the threshold. He introduced her to his household staff, and asked his chauffeur what he thought of the new mistress. The chaffeur replied, "She's a beautiful young lady, sir, but I hate to see a man start out on a day's work so late in the afternoon."

According to the Boston Health Department, "a substantially lower figure for bacteria means cleaner milk."

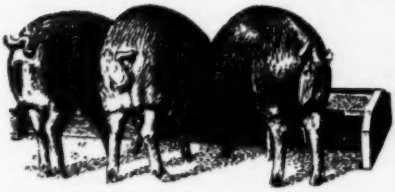
Certified Milk

On the Certified Milk Farm, the milk testing laboratory is the center of important activity. For Certified Milk, the bacterial count must be *exceptionally* low. For example, in a metropolitan city where the health department bacterial count for regular milk before pasteurization is required not to exceed 300,000 bacteria per ml. Certified Raw Milk, delivered to the customer, must count under 10,000 per ml., in accordance with the rigid Methods and Standards for the Production of Certified Milk issued by the American Association of Medical Milk Commissions.

Under the city regulations regular pasteurized milk must be delivered to consumers with not more than 30,000 bacteria per ml.; but the American Association of Medical Milk Commissions' required standards for Certified pasteurized is "not more than 500 bacteria per ml.," as delivered to the customer.

To emphasize further the safeguards employed on Certified Milk Farms, routine bacteriological examinations are made daily or at least once a week, or more frequently, as a Medical Milk Commission may direct. At least 50 per cent of samples of milk examined are "route samples" in final containers as delivered to the consumers.

Our Changing Hog Markets



It will pay to keep in tune with changing seasonal hog price trends. You make $4 to $5 more per hog by hitting peak markets.

Condensed from Farm Profit

KEEP up with the changes in seasonal hog price trends—then plan your production program to hit the peaks. You could net an extra $5 per head by selling your hogs when prices usually are high.

Seasonal trends are different now than they were 20 years, 10 years and even 5 years ago. The peak in annual hog prices is coming earlier in the year and there is less difference between the high and low points.

Before World War II, summer hog prices usually moved upward until September. Around 1950 the peak had shifted ahead to July and August as more and more farmers "saw the light." They raised earlier pigs and pushed them to market faster. During the past 5 years the average downswing has started as early as May, though not sharply until after mid-summer.

The trick is to sell your hogs before others flood the market. Indiana farmers have been doing a good job with early pigs. Ten years ago they took a close look at the changing price trend and began to move farrowings ahead. Hoosier farmers now sell more hogs during August and September—typically months of higher prices than later—than do other Cornbelt farmers.

The average price drop the past 3 years from August to October and from September to November was $2.25 per cwt. If you were to sell 100 hogs weighing 200 lbs., that would make a difference of $450 in your check. Average May or June marketings would have boosted the extra income to nearly $1,000.

The population of some prairie dog colonies is thought to exceed 400 million. Some spread over 25 square miles of land.

It takes advance planning to hit those May, June and July markets. It means you start breeding in August for December farrowings. And you need winter

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farrowing equipment and labor to start your pigs and push them on fast gains.

While about 70% of the total U. S. spring pig crop is born in spring months, Indiana farmers now get a head start by farrowing half their crop in December, January and February.

"During the past 8 years early marketings made Indiana farmers $13 million more than if they had followed the national marketing pattern," says Clifton Cox, Purdue marketing economist.

"We advise farmers to check their setup to see if changes in farrowing and marketing will make more money," Cox says. "A farmer must consider costs as well as gross returns in deciding when to farrow."

"Don't expect the present price trend to stand still," warns Francis Kutish, Iowa State market outlook specialist. "As the swing toward early marketings continues, the average monthly high might come even earlier in the year than it does now. More multiple farrowings would tend to level out prices."

Iowa farmers have jumped winter farrowings from 3% to 25% of their December-May crop the past 10 years. Ohio and Missouri now farrow 40% of their "spring pigs" from December through February.

"Main thing is to watch average trends from year to year," says Kutish, "and plan your production accordingly. Studying price outlooks and reports of prospective farrowings are big helps in making both short-run and long-range decisions."

There's A Big Difference in Cows

Some dairy cows are not capable of good production no matter how well they are fed and managed. You can use production records to eliminate such animals, says Ed Malcheski, dairy husbandman at the University of Wisconsin.

The average cow in Wisconsin produces 7,000 pounds of milk a year. DHIA records show that this cow will eat her way through $120 worth of feed. Other costs will be about $70. With milk at $3.50 a hundredweight, she'll return the farmer around $55 for his labor.

Now take the cow that produces 11,000 pounds of milk. Her feed costs will be almost $170, and she'll cost a farmer $84 additional. But she'll return $134 to the farmer for his labor . . . more than double the return on the average cow. —*Wisconsin Extension*

Milking Parlors — Do We Spend $10 to Save $2?

An English dairyman traces the development of the milking parlor in his country and wonders about its future . . .

Condensed from Farmer and Stock Breeder

John Jennings

FASHIONS change, they come and go. One is bound to wonder whether the milking parlour is here to stay or whether it, too, will become a fashion of the past. Prices have been steadily rising for years, the cost of feedingstuffs, labour and capital equipment perhaps more so than most. It was with all this in mind that the whole conception of the milking parlour was evolved.

The original idea was to make greater use of forage crops, milking the cows through a portable bail (pre-fab, open milking stalls fabricated largely of tubing and equipped with milking machines) which could be sited on the crop itself.

The snags of this system soon became painfully apparent. It worked well in summer, but because about half the year in this country is winter, the fields became mudbaths on all but the highest land, being continually poached by the cattle and by the tractor, which had to be used to move the bail and cart the milk. The storm lantern was the only source of light during the long winter months.

The logical step was to drag the bail on to a patch of concrete within a fenced yard during the winter months, and rely on vast quantities of straw to keep the cattle warm and dry. Even after the expense of replacing the fences with walls to keep the wind out, this system became quite impracticable on all but the farms of the Eastern Counties, where straw was plentiful and rainfall low.

Roofing Success

A roof was next constructed over half the area and found so successful that before long many had extended it to cover the whole yard. Cattle were dehorned to accommodate greater numbers under the same roof, and the bail

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itself was possibly converted into a two-level type parlour to save the operator backache.

Then the cows could be pushed through so fast that they did not even have time to eat up their due ration of food; so the more enlightened farmers promptly set about the task of dividing the herd into two or three groups according to yield and feeding each group correspondingly.

Even then the weaklings got none, while the greedy ones became fat and lazy. The floor was therefore concreted and mangers and tyings installed.

The only real difference between this set-up and the old traditional shed is that now cattle can lie anywhere, even on their own droppings, and the total covered area is nearly double that of the old type of shed.

Yields from parlour-milked herds are probably lower, and many people are prepared to lose up to a hundred or more gallons per cow, worth 600 to 1,000 English pounds (a pound is about $2.80) on a 40-cow herd, to save perhaps as much as a couple of hundred pounds a year on the extra labour involved in daily cleaning out and the manhandling of milk in the type of cowshed which has so long stood the test of time.

Timber Bids Increase Profit

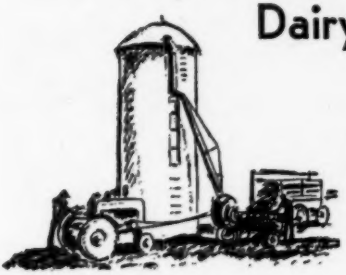
In Indiana, use of a publication prepared by Purdue University foresters enabled two southern Indiana farmers to greatly increase financial benefits from sale of timber. The publication, mimeograph F-28, lists primary wood-using industries of southern Indiana.

A Harrison County woodland owner, following the recommendation of the district forester, used the mimeograph to advertise 19 marked trees for sale from his classified forest. Six sealed bids, ranging from $2500 to $6185—a variation of $3685—were received.

A Bartholomew County farmer had been offered $250 for all the trees—mainly red and white oak, tulip and beech—on an eight acre tract. None of the trees were of veneer quality. The farmer did not sell for $250 but marked the ripe trees and asked for bids from buyers listed in the mimeograph. Five bids were received, the highest being $650 or $400 more than the original offer for all the trees.

The mimeograph is available from county extension agents or the agricultural office at Purdue. —*Indiana Extension*

Plenty of Good Silage Boosts Dairy Profits



Field choppers and the modern silo can provide quality roughage at low cost . . .

Condensed from Tennessee Farmer

THREE things are essential to profitable dairy farming — good cows, good management and good feeding.

Artificial breeding associations have made it possible for any dairyman to have good cows. The use of superior bulls for a few generations can accomplish wonders.

Good Management

Good management consists largely of doing the things which we know should be done and doing them at the proper time. Some of our most valuable information comes from studies of Dairy Herd Improvement Associations' records. One thing which is very evident from these studies is that most dairy cows are capable of greater and more profitable milk production if changed to better programs of feeding and management.

The one change which has secured the greatest increase in dairy profits for the most farmers is improvement in both the quality and the quantity of roughage provided for their cows. The average of the cows in DHIA work is much above the general average, yet the production of many of these herds was definitely handicapped by poor roughage programs. In speaking of such herds, Mr. G. A. Williams who directs DHIA work in Indiana says, "It is safe to assume that a well-planned and carefully managed feeding program, built on plenty of high quality roughage, would have resulted in an increased income of at least 25 per cent."

Save First Alfalfa Crop

The value of first quality alfalfa hay has long been recognized, but too often farmers fail to realize what a small percentage of their hay could really be rated as excellent for milk production. The U.S.D.A. says: "Rain during field drying may easily reduce the value of hay 30 to 40

Reprinted by permission from Tennessee Farmer, Box 210, Middletown, Kentucky

per cent, a loss that may be avoided by putting the alfalfa in the silo."

Corn silage has also been long recognized as an excellent and economical dairy feed, but the labor of cutting it and getting it into the silo was discouraging. Putting up grass silage in the old way was still slower and more costly. Present-day field choppers and the silo have made it possible for farmers to solve the problem of quality roughage at an economical cost. Making corn and grass silage doubles the value of the corn crop and makes high quality roughage available every year from the first cutting of alfalfa, instead of poor quality hay, most years.

It is now not only possible, but practical, for the cows to have access at all times to all the high quality roughages they will consume, and that is the backbone of economical milk production.

The first cutting of alfalfa can be put into the silo when it is at its best, because good silage can be made in weather when it is impossible to make hay, and after passing the one-fourth bloom stage, alfalfa rapidly loses its value for making milk. The silage is then available when pastures are past their prime. With plenty of high quality silage available, there is no reason for a herd to suffer a "slump" at any season of the year.

Small Grain Silage

Making silage from small grains is increasing in popularity, especially from oats and barley. They should be cut in the milk stage, if possible, and put in without wilting. Reports from Purdue and other experiment stations show that oats harvested for silage will yield from 2½ to four times the feed nutrients that come from harvesting the crop for grain. When legumes are sown with the small grain, removing the crop for silage gives the legumes a much better chance to survive. At Purdue, a wheat crop was cut for silage when the heads were just out of the boot, a second growth of wheat was ensiled 60 days later, and a cutting of the alfalfa-ladino mixture, which had been sown in, was made into silage in mid-August. The total yield of the three cuttings was 19 tons per acre. They report small grain silage as good as grass silage when both are properly made.

The key to low cost milk production is a plentiful supply of high quality roughage. The key to a plentiful supply of high quality roughage today is sufficient silo capacity. It is easily possible to have high quality silage all year round, every year. To depend upon hay alone is to have too many disappointments, with lower milk yields and higher costs of production.

One Bull Equals 2257 Calves a Year . . .

Through man's ingenuity, 2550 bulls fathered 5,762,656 calves in 1956. Read this progress report on artificial breeding . . .

Condensed from California Farmer

Roy Hitchcock

ARTIFICIAL insemination although relatively new, is one of the most useful tools the dairyman has at his command today. In an industry where every saving counts, this service has been a winner from the beginning.

Recently we interviewed Abe Solomon about the progress artificial insemination has made in California dairying. Solomon, as manager of the Sonoma-Marin Dairy Breeding Cooperative, Inc., manages the obtaining and shipping of semen of the cooperative's 25 bulls. The cooperative has new quarters just outside the city limits of Petaluma, California, where it maintains proven bulls of all breeds.

In presenting facts on the overall artificial breeding program today, Solomon said in 1956 about 5,762,656 cows were artificially bred out of the Nation's 23,028,000 dairy cows and heifers. To service that many cows, some 2550 bulls were used and that meant that each bull had to account for 2257 cows.

Despite gains, the artificial insemination service believes a more rapid growth is needed, Solomon said. He and others of the industry believe this will come when the dairyman realizes that artificial insemination offers a better, cheaper and handier method of breeding than can be found by using on-the-ranch bulls.

"Artificial insemination is cheaper in two ways," he declared. "First, it costs less than maintaining a bull, and second, it presents the dairyman—in most instances—with a better bred calf. However, management is still the key to success in the dairy business. On farms where good management is practiced, in-

Reprinted by permission from California Farmer, 83 Stevenson St., San Francisco 5, Calif.

creases in milk and butterfat of daughter over dam can be made. For example, in one instance the butterfat rose from 460 pounds a year per cow average to 560 pounds using artificial breeding. This, I admit, is the exception, but in most cases gains are usually substantial.

"On the other hand, on ranches poorly managed artificial insemination does little or nothing more for the dairyman than any 'calf-getter' he may have around the place. These dairies often have poor facilities, feed poorly, have inferior stock and bad milking habits.

Wettest spot on earth is believed to be Cherrapunji, India. It had 83 feet of rain in one nine month period; 40 inches fell in one day.

"We found that in comparing costs on 12 dairies in Marin County, with an average cow population of 68 cows, that it was cheaper to use artificial insemination. The bulls kept for breeding cost operators an average of $7.12 per breeding—ranging from $6.50 to $8.60. Artificial insemination, on the other hand, costs $6.50 per service. At this price, the dairies could afford to have several additional services and replace the bull with a cow that would give milk in the bargain."

Frozen semen is the latest trick in the artificial insemination business. C. L. Pelissier, Extension dairyman, reported that this development has been spectacular during the past year. He points out that the first calf from a cow inseminated with frozen semen was dropped in May, 1953. By the end of 1956, some 40 semen-producing organizations were freezing semen and using it in their areas of operation. In January, 1957, there were 342,356 ampules of frozen semen in storage and 27 per cent of these were from 68 bulls that were dead on that date.

Purebred breeders like frozen semen. It's a natural for them. They can freeze semen from a prizewinning, proven bull and can thus stretch his "get" way past his prime or death, Solomon remarked. He hopes to be able to offer some beef breeders a like service. Cost of frozen semen is higher than that of fresh, however, and the $1 to $1.75 increase may make some difference to breeders.

On the question of frozen semen for beef animals, Rube Albaugh, Extension cattleman, said that artificial insemination, although used somewhat successfully in the East, where herds are

In his lifetime, the average person consumes the total production from eight years milking of the average cow—48,710 pounds of milk.

small and easily corraled, had not been too successful in the West. He pointed out that beef animals have a much shorter heat period than dairy cattle. Corraling them, getting the semen there in time has discouraged its use. He also points out that breed organizations in beef cattle have strict laws governing frozen semen.

At present, not only California but the Nation has a long way to go before the records of Europe can be equalled. For example, 80 per cent of Denmark's dairy cows are artificially bred. In Holland, this number is 65 per cent and in Great Britain, 50 per cent. The National Association of Artificial Breeders believes that since all but a few of the "old wives' tales" about artificial breeding have been proven false, dairymen will use this method in ever-increasing numbers.

U. S. Cattle Authority Disagrees with Russian

One American cattle breeding authority is outspokenly in disagreement with a new breeding theory that's claimed to be the answer to Russia's milk shortage. Dr. John W. Bartlett, Rutgers University, has commented on cross-breeding being advocated by Trofim D. Lysenko, Russian biologist.

Lysenko's chief claim to fame is his theory that environment is genetically more important than heredity. Applying this to cows, he maintains that he has cross-bred Holstein cows with Jersey bulls and has got offspring that produce the high volume of the Holstein and the rich milk of the Jersey.

Dr. Bartlett's views on this are that there could be some increase in the butterfat test, but with a lowering of the milk capacity from the parent Holstein. It could result in a sort of blend.

Lysenko also claims that by special feeding during a cow's pregnancy he can bring about in the unborn calf the inheritance of the sire.

"Completely contrary to Mendelian inheritance," says the New Jersey authority. "This has no substantial backing of our geneticists. Improvement in dairying can come only from the selection of superior parents."

"The world's record dairy cow of 1900 gave 23,180 pounds of milk in a year. In 1955, thanks mostly to breeding from superior parents by selection generation after generation, the world's record was more than 41,000 pounds." —*Rutgers University*

Some Causes of Low Fertility in Cattle

Failure to calve may be a result of more than one cause . . .

Condensed from Guernsey Breeders' Journal

Harry R. Donoho,
Northwestern Ohio Extension Dairyman

MANY controlled experiments have been aimed at finding causes of low fertility. Some causes have been found, others have not. Many times low fertility is a result of more than just a single cause.

In 1938, Speilman and Jones reported a study made of the Oregon State College herd. This study represented 368 cows of four breeds. It covered 25 years and different cow families were compared as well as different breeds. The results of this study show a significant difference in breeding efficiency of 13.7 per cent between the breed with the highest breeding efficiency and the one with the lowest. When cow families within breeds were compared, significant differences in fertility levels were found in most cases.

Trimberger and Davis made direct comparisons between fertility levels of dams and daughters, but could find no significant associations. They did, however, indicate that some trends in the reproductive performance were present.

In general, there is little evidence that nutrition plays an important role in the level of fertility of Ohio dairy cattle. There are studies that show that a Vitamin A deficiency can, when severe, lower fertility. This deficiency might occur in the early spring when the supply of good quality hay is low.

A low phosphorous diet can also lower fertility. This condition could exist when little or no grain is fed along with poor quality roughage.

Freemartins

A freemartin is a sterile female calf born as a twin to a male calf. The exact cause of the sterility is still debatable. The chance of a heifer being fertile when twinned with a male calf is approximately six per cent.

A recent study made at Ohio State University indicates that approximately six per cent of the

Reprinted by permission from Guernsey Breeders' Journal, Peterborough, New Hampshire

cows will return in heat after pregnancy has occurred. This may occur any time after pregnancy, but usually it is from two to three months following the conception.

The question often arises, "Why wait 60 days following calving to rebreed a cow?" Many reports show that from 60 to 90 days following calving conception rates are best. Recent studies by Wisconsin workers have at least partially answered this question. It seems that the condition of the uterus at the time of breeding is very important for conception. The return of the uterus to its normal shape, size and position following calving seems to be largely determined by the amount of time elapsed.

The following table shows the results of the Wisconsin study:

Time following calving	Cows with normal uteri
30 days	6 per cent
45 days	44 per cent
60 days	75 per cent
75 days	87 per cent
90 days	96 per cent
105 days	99 per cent

It was shown in this study that young cows returned to normal (reproductively) an average of eight days earlier than older cows.

The Effect of Heat on Conception

Most reproductive studies agree that best conception rates are obtained when cows are bred from 60 to 90 days following calving. New York reports a study that indicates that a heat period following calving and prior to the service period as being highly important to conception. The study was made with cows that were bred under 60 days following calving. Those with a previous heat had a conception rate of 70.6 per cent. Those bred during the first heat had a 35.7 per cent conception rate. Healthy cows normally show signs of heat 35 to 55 days following calving.

Recent studies at Cornell University, University of Wisconsin and others show that embryonic mortality accounts for low fertility in many instances. Embryonic mortality usually occurs during the first three months of pregnancy. Their work points out that 15 to 30 per cent of cows return for repeat service because of foetal mortality rather than a failure to conceive.

Reports from both New York and Wisconsin indicate that the embryonic mortality rate is influenced to a certain degree by the sire used. Usually the mortality rate is higher with low fertility sires than high fertility ones.

A Wisconsin report of 100 repeat breeder cows, divided into equal groups of 50 each, points out the importance of embryonic deaths in cattle breeding. Fifty cows were slaughtered 16 days after breeding. It was found that 58 per cent of these cows were

pregnant. The other 50 cows were slaughtered 34 days following breeding. In this group 28 per cent were pregnant. Their conclusions were that in repeat breeder cows about 50 per cent of the time embryonic deaths occur. This usually happens between 16 and 34 days following breeding.

The cow is considered from four to six times more important than the sire in successful conception.

Quality of Semen

Most people concerned with reproduction in dairy cattle realize the importance of good quality semen on conception rates. Sires that produce a poor quality semen are of little value on the farm as herd sires. Those that are producers of poor semen are seldom used for any length of time in artificial breeding organizations. Repeat services are an expense to breeding organizations, technicians and dairymen alike. Therefore, artificial breeding organizations are constantly trying to supply top-quality semen to their members.

Poor Conception from Other Causes

Cows bred artificially should be bred from mid-heat to approximately six hours after heat for best results.

Structural defects in cattle sometimes are causes of low fertility. These cattle may or may not have normal heat symptoms.

Reproductive diseases in cattle can be very expensive to dairymen. These diseases are better diagnosed and controlled with the help of a competent veterinarian.

Hormone disturbances are proving to be more of a problem in dairy cattle reproduction than was once realized. Many cases of cystic ovaries, infantile ovaries, cows that ovulate abnormally, and heat periods without visible symptoms, are likely to be the result of hormone imbalances. Treatment is often difficult and the results are sometimes discouraging. Further research in the endocrine field of dairy cattle reproduction will no doubt give us answers to some of these problems.

Helps for Conception Rates

1. Keep accurate heat records on all cows.
2. Be sure the cow is in breeding condition (wait 60 days following calving before rebreeding).
3. Feed good quality roughage and grain whenever possible.
4. Breed cows from mid-heat to six hours after end of heat.
5. A healthy herd is essential for good conception.
6. Do not expect the herd or an individual cow's breeding performance to be the same from year to year.

Trim Costs by Trimming Hoofs

Hoofs may grow faster than cows wear them out, causing lameness and discomfort. Here are suggestions for trimming . . .

Condensed from The Kraftsman

Oran Bryant

TRIMMING costs is important to a dairyman, but so is another kind of trimming. Dale Cohenour, Milledgeville, Ill., believes in beginning at the bottom —by trimming his cows' hoofs.

When cows are confined to barns during the winter and are pastured on soils lacking in abrasive material, the hoofs grow faster than they are worn off. This results in the development of long toes that will eventually produce discomfort to the cow in standing and walking. Unless the hoofs are trimmed, lameness and a crippled condition may result.

The hoofs should be trimmed by chiseling off the fore part of the toe and rasping or chiseling off the excessive growth underneath. Extreme care must be exercised to avoid injury to the quick, which could lead to infection and additional lameness.

If the toes are too long, they may break off and get very sore, causing the cow to favor one foot. This puts unnecessary strain on the other legs and will weaken the whole cow.

If the front feet are not trimmed, the cow will either toe out or toe in with age and the ridge on the bottom of the hoof will become hard and sore. This may cause a cow to lean against the stanchion to support her weight. In time, this may cause winged shoulders which could result in loss of several years production.

Also, this ridge on the bottom of the foot will collect manure and dirt until it becomes full and level. This manure pack on the bottom of the foot makes the foot soft in the center and is a good place for foot rot to start. This will cause a loss of milk for from one week to six months depending on how serious it becomes before detected.

The hind feet are more important than the front in this respect. If the hock turns in it will injure the rear udder, and allow mastitis to get a start. Breaking

Reprinted by permission from The Kraftsman, published by Kraft Foods Co., Chicago 90, Illinois

away of the rear udder can also result which will cause a loss in production.

Weak pasterns, cycle hocks, or high arched backs may come from bad feet. The weak pastern will hinder the cow in grazing, and also may cause breeding trouble. The cycle hock will get so weak that the cow cannot walk properly. This will make her hunt a shade tree instead of feed.

Foot rot is often found in cows in winter and spring because a pack has built up and caused soft feet. Cutting off the ridge of the hoof will prevent this build up.

Gains Noted in Herds Using Artificial Breeding

Sizeable increases in milk production have been recorded in herds where artificial breeding is used, says Dr. V. L. Baldwin, Virginia associate dairy specialist.

A survey of Virginia herds completed last year showed that herds with over half of the cows from artificial breeding had made nearly a 25% gain in 7 years, or over 3% each year. Herds with less than half of the cows from artificial breeding made less progress, and herds with no cows from artificial breeding made no progress at all on the average.

Dr. Baldwin says that even a 3% gain over the 1954 average production of 8,388 pounds of milk would be more than 250 pounds. At $5.60 cwt., 250 pounds was worth $14. This would pay the breeding fee and still provide an extra profit of $8.00 per cow, while saving the cost of buying and feeding a dangerous bull.

There are many advantages to artificial breeding, Dr. Baldwin says. It makes the services of outstanding sires available to many herds. It is an effective aid in preventing the spread of disease. The cost of getting cows bred, especially in herds of 20 cows or less, is less than by natural breeding. The size of the herd can be increased with the average cost to breed each animal remaining the same. Two or more breeds of dairy cattle can be kept on the farm without the need for a bull of each breed, and two or more cows can be cared for in the space needed for a bull.

Artificial breeding also increases the value of the resulting calf either as a future herd replacement or if sold for breeding purposes.

—Virginia Extension

Holstein Steers Fed Out for Beef

Tests at Colorado A & M show dairy steers can make as much money as beef steers . . .

Condensed from Colorado Farm & Home Research

HOLSTEIN steers make good beef and feed out well, leaving a good profit for the cattleman.

Tests at Colorado A & M College show that raising Holsteins for beef can be worthwhile. A group of grain-fed steers brought a profit of $14 per head, while steers on a roughage ration realized a $10 per head profit. In view of market conditions, these steers compared favorably with beef cattle.

Experiments began in August, 1955, when test animals were bull calves, from 3 to 5 days old. Ordinarily, Holstein bull calves are a drag on the market since they have no value in a dairy operation.

The animals were raised on milk and calf starter, and went on pasture at about 10 months of age. After one year, the 13 steers were divided into two groups.

One group received daily rations of 13 pounds of grain—a mixture of corn and beet pulp plus a half pound of protein supplement. This was fed for 100 days.

When marketed at the age of 16 months, the seven grain-fed steers averaged 1004 pounds. During the feed period they gained 2.7 pounds per day.

Six steers were in the second group. When they went on feed, they were given silage (2/3 alfalfa and 1/3 corn) plus hay. The

The first thing most people grow in gardens is tired.

feeding period lasted 156 days. At slaughter the steers were 18 months of age and averaged 1031 pounds. Their rate of gain was 1.75 pounds per day during the feed period.

Dr. Gerald Ward, assistant dairy husbandman with the Colorado Agricultural Experiment Station, was in charge of the tests. Melvin Hazaleus, associate animal husbandman, assisted with cutting and grading.

Holstein steers, according to the study, will gain as economically as any of the beef breeds but they take longer to reach maturity.

When dressed out, the carcasses

Reprinted from Colorado Farm & Home Research, Colorado A & M Experiment Station, Fort Collins, Colorado

graded "standard," one step below "good." Marbling was good in rib and loin cuts and in roasts taken from the chuck.

"Raising Holstein steers is an opportunity for livestockmen to feed lower grade cattle, yet make as much money as the cattleman who feeds the usual beef breeds," Dr. Ward said.

Silo Gases Can Kill

Don't get in the silo or silo chute at filling time until you run the blower for a few minutes.

Several cases of silo gas poisoning have already been reported in various parts of the country.

Researchers emphasize that there's little danger if farmers follow a few simple precautions when they're filling silos. The dangerous gases are carbon dioxide and nitrogen dioxide. Carbon dioxide is heavier than air, so it settles in low spots. It pushes the oxygen out of the space it occupies, so you may suffocate for lack of air when you enter an unventilated silo after it settles below the doors. You cannot see or smell carbon dioxide.

Under certain conditions, new silage also produces nitrogen dioxide—a very poisonous gas. Even a few breaths may seriously damage the lungs, and a very little more can kill you.

Fortunately, nitrogen dioxide may give you a warning; it has a sharp, irritating smell like bleaching compound and you may notice a brownish-yellow color when there's a heavy concentration of the gas. But the researchers warn that the gas is deadly, even when there's not enough to produce the yellow color.

Another gas sometimes found when certain chemical preservatives are used is sulfur dioxide. This gas is very irritating and gives you sufficient warning to get out of the silo quickly enough.

During silo-filling time, always run the blower for a few minutes to get fresh air into the silo and chute before you go in.

Also, leave the windows and doors open in the silo room for a few weeks after filling. Well in advance to spending any time tramping the silage, take out the doors down to the silage level and leave the silo roof door open to help ventilation.

Barn areas near silo rooms should also be ventilated. There have been reports of the gases killing chickens and heifers located near the silo room in an unventilated part of the barn.

If you think you've noticed ill effects from silo gases, get into fresh air immediately and have somebody call a doctor.

Can Your Prize Cow Have Ten Calves A Year?

British scientists experiment with sheep and surgery to hurry breed improvement . . .

Condensed from Wall Street Journal

Kenneth W. Bond

WHITE-smocked agricultural scientists working in test tube filled laboratories in England may be on the verge of giving birth to a farmer's dream—producing ten blue-ribbon calves a year from a single prize cow.

This seemingly impossible feat has already been partially accomplished in laboratories of the Moltena Institute of Biology and Parasitology at Cambridge where researchers have been delving into a bit of biological juggling known as ovum transfers.

For the uninitiated, o v u m transfer is a man-made method of livestock breeding somewhat akin to artificial insemination. It involves the transplanting of a cow's fertilized ova, or eggs, into the wombs of a number of other cows, each of which is then supposed to produce a calf. It's been made possible only in the past decade through advanced surgical know-how and the development of hormone treatments.

How It's Done

The nature-tampering being attempted by the British scientists is briefly this:

A hormone serum, obtained from the pituitary gland of pregnant mares, is injected in a top-grade cow, for example. The serum should cause the animal's ovaries to send a greater-than-normal number of eggs from the ovaries toward the womb; they can be fertilized en route. The ovaries contain thousands of eggs but normally only a very few are used during the animal's lifetime. The process of inducing the ovaries to greater activity bears the tongue-twisting name of super-ovulation.

The eggs are fertilized either by artificial insemination or by natural breeding and extracted from the female. Then they are trans-

Reprinted by permission from Wall Street Journal, Chicago 90, Illinois

planted by surgery into the wombs of several other cows, who, in effect, will become walking incubators.

The theory is to use cows of less quality, less desirable breed or who are sterile. No matter what the bad characteristics of the host or recipient cow the calf should show all the qualities and characteristics of the prized real mother and none of the shortcomings of its host mother. Thus a farmer with one prize Holstein cow and nine substandard cows could get nine or ten top-grade Holstein calves.

Sheep Are Cheaper

So far, most of the egg transplanting experiments here have been carried out on sheep—they are cheaper to buy and maintain than most other farm livestock—but scientists claim that bovines respond equally well to ovum transfers.

During recent institute experiments, scientists gave three top grade ewes shots of the hormone serum or P.M.S. They were able to recover 30 fertilized ova which were transplanted singly and in pairs into 16 recipient ewes of different breeds. Five months later the 16 ewes had given birth to 24 young lambs, each with unmistakable characteristics of the donor parent.

In the meantime, the same three donor ewes had been mated and produced two single lambs and a pair of healthy twins. The net result of this biological sleight-of-hand was 28 top-grade lambs. Normally, out of the three ewes there would only be four or five lambs a year.

Other experiments disclosed that fertile female eggs can be stored safely in a freezer and need not be transplanted immediately. Six lambs were born from ova which had been refrigerated at eight degrees centigrade for three days.

The scientists admit that more research is needed to improve the superovulation and egg recovery techniques. But they say the experiments so far have proved that artificially stimulated eggs can be used successfully for breeding purposes and as an aid to curing sterility. The work also shows that the delicate transfer technique used is relatively efficient.

Boarders

**The price is up a little now
And Joe will sell his only cow.
To wait against a market gain
Is often sound. But, in the
main, If you have cows-you-
keep to sell—Digest this les-
son soon and well—They can-
not help you to succeed By
keeping them; so, sell, indeed!
The cows to save—believe it,
do!—Are just the ones that
help keep you. —Jerry Fisher
in COBA News.**

Ten or More a Year

The researchers claim it should be possible in the future for a prize cow or ewe to be responsible for producing ten or more young a year. As a result of superovulation, one female might provide more eggs for incubation inside poorer quality animals in one season than she could produce normally in a lifetime.

Aside from the obvious aid to more rapid build-up of top grade herds or flocks, ovum transfers have other thought-provoking possibilities. For instance, farmers wanting to introduce new improved strains into their herds or develop better breeds could obtain small containers of refrigerated ova rather than importing the live animals.

The English scientists claim that superovulation doesn't affect the fertility of the donor animal and that the artificially-bred animals retain their libido—a Freudian expression meaning the desire to breed in the normal manner.

The biggest disadvantage, they say, is that the transfers involve surgery. But most of the researchers believe a method of transplanting the ova without the use of the knife may be found.

Milk Cows Are Worth More

"Bossy's value is on the upgrade," Virginia dairy specialists say. In the past 18 months prices for milk animals have moved up gradually. They reached an average of $165 in July, marking the highest level since July, 1953.

A milk cow's value depends on her ability to produce milk, and on her salvage or carcass value. The drop in beef cattle prices, which began in 1952, was largely responsible for the decline in average prices received by farmers for milk cows from a peak of $265 per head in 1952 to a low of $141 per head in December, 1954.

Low beef prices definitely hinder the culling program in most dairy herds. The low carcass value of cull dairy stock has tended to hold down the rate of culling. The increase now underway in beef prices may induce many dairymen to sell a few more of the older cows, and to keep a greater number of heifers for replacement than they have in the past few years.

Dairymen are in a relatively favorable position, as beef cattle production moves downward. The current phase of the cattle cycle will result in higher prices for low-grade animals culled from the dairy herd. —*Virginia Polytechnic Institute*

Feed Automatically in Stall Barns

The silo unloader and feed conveyor now mechanize silage and chopped hay handling . . .

Condensed from Electricity on The Farm

Ralph Bowen

WISCONSIN farmers are finding that dairy cows housed in stall type barns eat better when they are fed indoors. Cows will not eat well in stormy outdoor weather.

Bunk feeding is easily installed for outdoor feeding. However, it is more difficult to fit a satisfactory feeding mechanism into stall type barns. Some people have done it by adapting conventional barn cleaners for carrying feed around to the mangers. This practice quite often poses a difficulty in that the paddles tend to raise and slide over the silage material being fed.

Clarence Ladwig, a dairy farmer from De Soto, Wisconsin has solved this problem. He welds a small piece of angle iron on the outer end of each paddle to make it the full width of the feed manger. Silage tends to pile up over the angle iron. This weight is enough to keep the paddles resting firmly on the bottom of the feed manger.

Ladwig uses a 5 hp silo unloader to feed corn silage directly into the manger feeder. Switch controls for both silo unloader and automatic feeder are located adjacent to each other. When cows are fed, the silo unloader is started first and delivers a small amount of material into feeder before it starts operating. Then by adjusting the two switches so as to maintain the correct layer of material in the conveyor at all times, he is able to feed his 50 head of dairy cows in about eight minutes.

After the cows have eaten the grain and silage, the same unit is used to distribute mow-cured chopped hay to the feeding mangers. An arch in the center alley deflects the hay onto the conveyor as it is thrown down from the mow. An opening in the feed manger directly over the gutter cleaner permits the automatic feeder to clean the feed manger as the feeding operation is going on.

Ladwig says that the automatic manger feeder has actually saved him more labor than his barn cleaner. However he is quick to add that he wouldn't want to do without either one of them.

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Will More Land, More Livestock Make Money for You?

These paragraphs from a farm manager's newsletter give facts and figures sure to interest you . . .

Condensed from Do-Well Timely Hints

Robert Gish and *Jesse Dowell*

SOME farmers increase the size of their farm business by adding acres; others do it by adding more livestock. In either case the result is often a decrease in production cost per acre or per head of livestock. The question most often asked is how much decrease, or in some instances increase, takes place.

In recent years we have not been able to observe from our farm record data that any one size of farm is best suited for one man or for one complete set of crop or livestock equipment. Not all farms have the same resources to work with, and some of these resources are not divisible into small units. If extra land more fully utilizes the buildings, equipment, and labor that are already available you are in a much more favorable position to expand than if you have to add extra equipment.

A study of crop costs per rotation acre in a corn-corn-oats-clover rotation on 33 northern Illinois cattle-hog farms was made for 1955 from detailed cost accounts. Sixteen farms averaged 277 acres in size and 17 farms averaged 160 acres. There was no difference in certain crop costs per rotation acre, such as annual fertilizer cost, seed and crop expenses, land taxes, and some other expandable items. However, certain other costs, in-

	160 acre Farms	277 acre Farms	Difference
Machinery, including depreciation ...	$13.70	$10.66	$-3.04
Labor, including Operator & family ..	6.06	4.99	-1.07
Buildings, including depreciation	4.53	3.27	-1.26
General farm expenses	2.81	2.07	- .74
		TOTAL DIFFERENCE	$-6.11

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cluding depreciation on machinery and buildings, payment for family and operator's labor, insurance, personal property taxes, and other overhead expenses listed in the preceeding table were $6.11 lower per rotation acre on the 277 acre farms than on the 160 acre farms. This is a saving of $611 per 100 acres, or about a 10 per cent reduction, in total crop costs for the larger farm group.

A similar comparison was made of hog production costs on three sizes of hog enterprises. Costs that were affected by size per 100 pounds produced were $3.35 for the 47 litter size, $3.00 for the 75 litter size, and $2.74 for the 135 litter size. This is a cost reduction of about two per cent on the total cost, or $370 between the 47 and 75 litter sizes, and $720 between the 75 and 135 litter sizes.

The reasons for these cost differences under the levels of managerial ability that existed on these farms were that:

1. Most farmers pay dues in only one farm organization, drive only one car, have only one set of complete buildings, have only one fence surrounding their farm, etc. Such farm expense items decrease per unit of production as size of the business increases.

2. Larger farm businesses often provide for more efficient combinations of resources, such as larger or better machines, which save labor. Lower machinery costs account for half of the total lower cost of crop production in the comparison shown below.

3. Larger farms often make more efficient use of existing resources. Nearly half of the costs saving in the hog comparison was due to less labor per litter on large enterprises.

If machinery, labor, buildings, and other general farm expense remain high, as is predicted, and continue to contribute to the squeeze on farm profits, there may be higher profits for farmers who can spread the costs associated with these items over more units of production.

No costs as yet are available on a large number of farms over 277 acres, such as a section (640 acres). But with reduced building costs, pro-rated on a per acre basis and reduced machinery cost pro-rated on a per acre basis on a section (640 acres) compared to fewer acres this without a doubt will be the next big change in East Central Illinois farms. Farm size will now rapidly become much larger and yet family sized, due to much higher building and machinery costs. The only thing that will slow this profitable change, is unprofitable sentiment and tradition. And it is going to take a sharp business man to operate a section-sized farm worth $200,000 or more.

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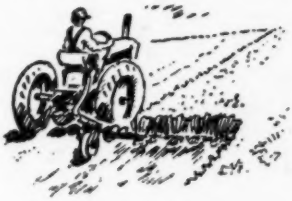
Harvest Your Forage When It's Right



There's plenty of room to improve your forage program with better methods, better timing . . .

Condensed from
Eastern States Cooperator

Kenneth E. Paine

TIMELY harvest of forage is a most urgently needed practice on dairy farms. Thousands of pounds of nutrients and thousands of dollars of profit are lost each year because forage is not harvested when it is "right" and in a manner to maintain its value.

Great progress has been made in forage production. Improved varieties, new species and more effective fertilization and management have resulted in tremendously increased production in forage per acre. But, untimely harvesting, along with destructive handling and preservation have seriously counteracted the benefits. In many instances the amount of milk produced per acre from harvested forage has increased very little or not at all; and milk production per acre is, in most instances, the real measure of effectiveness of a forage program.

Immaturity Is Imperative

Immaturity of grasses and legumes at time of harvest is the first essential for high quality forage. When rapid vegetative growth ceases and the maturity process starts, palatability, digestibility and per cent of protein start to decline; and no amount of care in harvesting or preservation can return what is lost.

The ideal balance of quality and amount is reached by alfalfa and clovers for the first cutting in the spring just as blossoms start to appear. Some authorities say one-tenth bloom and some conservative folks, for practical reasons, would permit delay to one-fourth bloom. All agree that net losses occur rather rapidly after this stage.

For grasses, even earlier cutting is necessary for top quality and value. Here the heads should just be appearing and no blossoming should have occurred. With most grasses, the decline in quality after this stage is even more rapid than it is with legumes; but different grasses do vary somewhat in this process. Smooth bromegrass has a relatively slow quality

Reprinted by permission from Eastern States Cooperator, Springfield, Massachusetts

decline and orchard grass has one of the most rapid, with timothy midway between the two. All legumes and grasses decline in feeding quality and in milk-making ability with each day delay in harvesting after head formation.

Cornell Agricultural Experiment Station reported 16.4 per cent total protein on a dry matter basis and a milk production per cow of 47.8 pounds of milk from silage harvested June 7 and only 10.3 per cent total protein and 42.1 pounds milk per cow from silage made from the same crop on July 5. The report stated further "cows on early cut gained weight; those on late cut lost weight."

USDA Farmers' Bulletin 2052 states: "Immature grass is more palatable and nutritious than mature grass. The vitamin, protein and phosphorus content of young grass is higher and the nutrients are more efficiently utilized than those in old grass."

The proof is clear and positive that early season harvest when both legumes and grasses are still in an immature stage is essential for the highest quality forage.

Plan and Prepare

Early harvest in the Northeast is more easily stated than accomplished, however. Advanced planning and careful preparation are imperative. Ample equipment of the proper kind for the system to be followed, and all in good repair and adjustment, is a first consideration.

First, what system will you use to harvest and preserve the high quality immature succulent legumes and grasses produced on your forage acres this year and succeeding years?

Field Curing

The best field curing of hay results in a dry matter loss of 25 to 30 per cent. The protein loss per acre is about equal to two bags of soybean meal. If rain damage occurs, the loss may well be doubled.

R. E. Hodgson of USDA reported that during one year of forage testing when rain damaged the tests, 40 per cent of the dry matter and 50 per cent of the protein was lost in field-cured hay..

Good field curing requires a minimum of three continuous days of clear warm weather. Weather records show that there is only one chance in three of getting such weather during the period forage crops are at a high quality stage in the Northeast.

Consequently, Robert West Howard wrote in Farm Quarterly, "Feeding grasses and legumes as hay is one of the oldest and most appalling wastes on American farms."

Crushing and Finish Drying

This stupendous loss is no longer necessary, however. Hay can now be made with the time in

the field after cutting reduced from three to two and even to one day. Losses are reduced accordingly. Two keys to such hay making are:

1. Stem crushing.
2. Finish drying.

Crushing must be done *immediately after cutting.* It can shorten the drying time by as much as 50 per cent. Finish drying may be from as high as 50 per cent moisture, and may be by a large volume of natural air or may be by heated air. Drying is being done in mows, on wagons, and in special curing areas both indoors and outdoors. It is being done to long loose hay, to baled hay and to chopped hay.

The peregrine falcon has been clocked flying 175 miles per hour.

Hay is now being made so that 20 per cent more milk per acre is resulting in comparison with the same crop wholly field cured. This is letting 80 acres equal the milk production of 100 acres. It is getting 2400 pounds of milk from an area instead of 2000 pounds. It is feeding six cows from the same acreage as fed five formerly.

Field curing of hay is rapidly being antiquated.

Hay Chopping

Professor F. W. Duffee, agricultural engineer, University of Wisconsin, has this to say in regard to chopped hay. "It requires much less labor to harvest hay with a forage harvester than with a self-tying baler, but many farmers have objected to chopped hay because it was chopped too fine and was dusty. There are choppers on the market today that will produce satisfactory chopped hay. The knives are mounted at an angle of 30° to the disc on a fly-wheel type machine and the mounting is streamlined to permit smooth flow of the material through the cutter head. It is always desirable to operate the cutter head at a slow speed for hay so as to reduce beating of the hay. For fly-wheel type machines, speeds of 400 to 600 rpm are recommended with two knives on the cutter head. The machines should be set for at least three-inch machine cut, then the actual average cut will be about six inches because most of the hay goes through more or less crosswise."

Certainly the size of crew needed to carry on an efficient chopped hay operation is smaller than for any other system. It is the only known method of hay harvesting that largely eliminates physical man power. With only one chopper, it may be slower than a baled hay operation with a balanced crew.

Either a chopper or a baler will damage hay physically if it is much drier than 30 per cent mois-

ture. Either requires finish drying for highest quality hay.

More farmers are today baling hay than are chopping hay, but the latter practice is increasing. Professor Mark E. Singley, agricultural engineer, Rutgers University, has stated: "This is a method that can potentially reduce labor required, not only during harvest but also during feeding. Chopped hay is the best hay form for self-feeding and self-feeding is attracting much interest today. Another very important benefit of a chopped hay program is that the same machinery is used for harvesting forage for hay and for silage."

Grass Silage

After all this discussion of hay making, let's hasten to appreciate that the practice which most often and most effectively permits the timely harvest and efficient preservation of the first cutting of a good forage crop in the Northeast is making it into silage.

Field losses of dry matter, protein and carotene are almost completely avoided by either direct-cut harvesting or by wilting to 65 to 70 per cent moisture. Fermentation and leaching losses need not exceed 10 to 15 per cent dry matter compared to losses of 30 to 50 per cent or more for field-cured hay.

Silage making is far less influenced by weather than is hay making, even with the use of stem crushing and finish drying. Consequently, to be able to consistently harvest forage when it's right, silage making should always be included; and should be the method usually used for first cutting most years in most areas of the Northeast. Every dairyman with a good forage production program, using vigorous growing legumes and grasses adequately fertilized is "paying" the cost of a silo and silage-making equipment. Rather than "paying" these costs in forage nutrient losses, it is far better to pay them in purchase prices and have the benefits that result.

Harvesting forage when it's right by a method that will preserve and conserve its nutrients and milk-making ability may well be the greatest single step to profitable dairying. The stage of maturity of the plants at the time of harvest is more important than the particular method used as long as that method does save the nutrients during harvest and storage.

No method known today is perfect and without some shortcomings as well as assets. No one method is best for all farms nor for all seasons. Selection of a method or methods is "a matter of economics which will differ from farm to farm and can best be decided on the basis of availability and cost of labor, equipment and facilities.

What A Difference New Type Dairy Barns Make

"Instead of quitting, I'm more sold on dairying than ever," said one farmer.

Condensed from Kansas Farmer

Dick Mann

AT LAST someone has designed a milking barn that gives the producer of manufacturing milk some of the efficiency of grade-A barns but at a very small cost.

We have just completed a tour of manufacturing milk producers in 4 counties to study first-hand the new V-type and L-type barns that are becoming popular in that area. We looked at new barns and old barns remodeled to give the producers this new elevated-stall convenience. Here are comments made by some of these producers concerning their improved set-ups:

William Burt, Allen county, a new dairyman: "I had planned to use an old 9-stanchion barn already available, but when I saw one of my neighbors milking in his new V-type raised-stanchion barn and found out how cheap I could install one in my barn I said: 'That's for me'."

Louis Pool, Bourbon county, says: "I cut 30 minutes off the milking time on 9 cows. Now I have taken over a town job and Mrs. Pool has taken over the milking, a job she couldn't have handled in the old barn."

Harold Rhynerson, Linn county, says: "I was ready to quit milking when I discovered I could remodel my old barn into a modern V-type raised-stanchion milking parlor. Now, instead of quitting, I'm more sold on dairying than ever."

Omer Stoll, Woodson county, says: "I installed an L-type preparation-stall milking parlor in my old barn and now it takes a lot less work to milk and a lot less work to clean."

Walter Regehr, Allen county, says: "I built a new portable L-type milking barn, using mostly old lumber and other material I had on hand. Now I can milk 10 cows in 35 minutes. Recently, I hurt my back so badly I couldn't stoop over for awhile.

Reprinted by permission from Kansas Farmer, Topeka, Kansas

Had I still been using the old barn I would have had to find someone to do the milking. But, with the new barn, I was able to do it all despite the injury."

What does it cost to erect one of these new type barns or remodel an old barn to install the new facilities? So little we are almost afraid to tell you. If you use old lumber and can do all the work yourself or with help of neighbors, you can have these modern milking facilities for production of manufacturing milk for less than $500.

Here is an actual material cost breakdown on the Harold Rhynerson remodeled barn, which was one of the more expensive jobs we inspected:

Concrete blocks	$ 13.00
Sand	18.50
Cement	49.63
Lumber	69.24
Tile	5.10
Pipe	20.00
Rack	16.00
Labor	44.00
Sliding door hardware and floor drains	29.33
	$264.80

William Burt reports material costs under $200 for his remodeled barn. Louis Pool estimates his material costs for remodeling at $200. Because he was able to install one of the L-type plans in his old barn without any remodeling, Omer Stoll had a material cost of only $100. Walter Regehr, who built a new portable L-type barn out of mostly old materials had a material cost of less than $250.

What is a V-type Milking Shed?

The V-parlor, designed primarily for a one-person operation, is especially adapted for a one-unit milking machine. The small structure consists of 2 elevated stalls with one entrance door and 2 exit doors, controlled from the milking pit. While one cow is being milked, the operator can prepare another for milking. Up to 15 cows an hour can be handled with a one-unit milking machine. To get maximum efficiency you should use a cow-to-can milker.

What is an L-type Milking Shed?

The L-type milking parlor also is small, using 2 elevated stalls in line for milking and a preparation stall at right angles to form the L. Cows some up steps into the preparation stall, are prepared for milking, and allowed to go on to one of the 2 milking stalls. Another cow is admitted for preparation while first cow is being milked. Two units can be used with this setup. Idea is to cut down milking by the operator and to keep most of mess in the preparation stall area.

Do these new barns improve milk quality?

Those in Kansas have not been in operation long enough to tell

and surveys of similar barns in the South are not conclusive. An examination of records at the Pet Milk Co., Iola, indicates that whether improvement results depends pretty much on how careful the producer had been in the past. New barns, especially where cow-to-can milkers are used, should make it easier to produce clean milk. If coolers are used they also should help bacterial counts.

Will the new barns improve herd production?

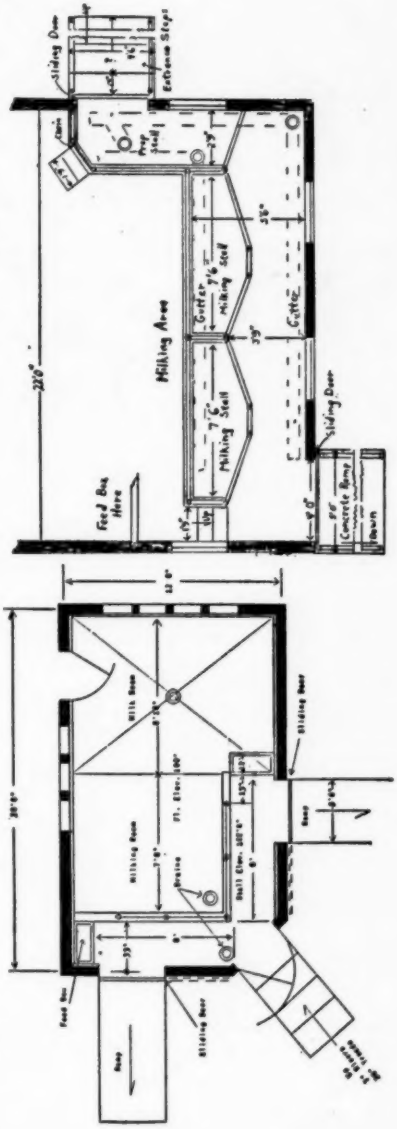
There is no way to tell this but the raised stanchions give the operator a chance to spot udder trouble sooner, thus tending to avoid troubles that lead to poor production.

How much do these new barns cut labor?

Surveys in areas where these barns have been in use longer indicate labor is cut more than half on the over-all job of cleaning cows, feeding and milking. The job is much more pleasant, also.

Where may we obtain plans for these barns?

With this story you will find floor plans of both barns. Pet Milk Company fieldmen believe that by studying these and visiting one or 2 of the barns you



Right, above: Here are floor plans for both the V-type (lower) and L-type milking sheds described in this article. They "cut many minutes off milking time," users say, yet cost as little as $200.

could build your own. However, more detailed plans may be obtained from Pet Milk Co. plants.

What over-all effect on milk production will these barns have?

Every farmer we talked to who has one of these new barns plans to increase his herd size. William Burt is increasing from none to 14 head; Louis Pool, was milking 7, now 10. Harold Rhynerson is milking 8 head, plans to increase to 12 or 15. Omer Stoll is milking 13 cows, plans to increase to 30. Walter Regehr will increase herd from present 10 cows to 30 cows.

One advantage of these low cost barns is that you have enough money left to invest in more cows.

Can I get a loan to finance one of these barns?

Yes. Local bankers and the Farmers Home Administration have been glad to make loans on these barns in the area surveyed.

Balanced Cattle Forage from Horizontal Silos

Horizontal silos fit into the new system of year around balanced forage feeding, says I. W. Slater, Wyoming University extension dairyman. These silos, he says, provide large storage capacity at a lower investment and allow cheaper filling and feeding costs. They are huge trenches dug in the ground or are side walls of lumber or earth built on the surface of the ground. In either case one or both ends are open.

The new "balanced forage system" of feeding calls for animals to eat 60 to 80 pounds of grass or legume type silage daily most of the year. Such feeding requires more silo capacity than the old system. Under the old system, cows received about 30 pounds daily for 6 winter months each year.

Farmers can build horizontal silos as twins—one for corn silage and the other for grass silage. Use of an airtight, waterproof, weighted-down plastic cover over the face of silage being fed reduces spoilage between feedings.

Farmers report excellent results from the new feeding system. The system allows more storage at lower cost and great feed savings. Cows managed under this method give more milk even though fed low cost forage. —*Wyoming Extension*

My Experience with Zero Pasture

A New York dairyman stands back, takes a long look, and reports on his experience hauling pasture to dairy cows . . .

Condensed from American Agriculturist

Norman E. Thompson, Dairyman

MY experience with zero pasture has been varied over the past three years. During 1956 most of the mistakes and difficulties were eliminated to give the desired results. Briefly let me tell how we became convinced that zero pastures is preferred on our farm.

During 1951 and 1952 the 38 cows were on rotated pastures and milked in a conventional barn. We moved stock to my own barn in December 1952 which is of the pole type and has a milking parlor. This barn never had carried over 15 head before. Our brook pastures were often wet, full of onions, and across a county road often blanketed by fog. In 1954 we supplemented our pastures with grass at silo filling time. Even though the cows were on good pasture, the response in increased milk production gave impetus to do more grass feeding.

We built a self-feeding wagon and through August and September we gave them a load each day. In 1955 we improved the wagon and fed twice a day. The wagon would accommodate only 25 cows at a time. This relieved us of pitching it to bunks to maintain our milk flow, but the following objections arose.

1. Excessive waste on ground; also cows failed to clean out the corners.
2. Difficulty in keeping wagon free of all spoilage. A little would discourage proper cleanout by the cows.
3. Heating of grass before wagon was cleaned out. Hot sun would force cows to leave wagon and by the time they returned, it was heated beyond a desirable consumption level.
4. We tried feeding the top off the wagon into bunks to satisfy those over 25 in number who were unable to get around the wagon, but all the cows would prefer to eat from the bunks than to go to the wagon, thus crowding again.
5. So many cows **trampled** around the wagon that a new area had to be provided, as it

Reprinted by permission from American Agriculturist, Ithaca, New York

left the area untidy and void of any grass.

6. When we alternated with zero grazing and a nearby pasture of ladino clover, the cows would drop in production when turned out as they would not eat enough during hot days, and would stand in the shade at the far end of the pasture, which is far from the barn.

Our Solution

In 1956 we chopped grass twice a day from May 15 to October 12th and pitched it all into bunks (423 tons of it) throughout the season. We weighed several loads and each averaged about 2500 lbs., for the 38 cows to consume 133 lbs. per cow per day. The sudan grass loads were heavier. To eat, the cows stood on blacktop and in the shade. Manure was cleaned out twice a week and bunks swept clean as needed.

Our forage program sounds like it might present problems such as that of having adequate feed at the right time. Actually the zero grazing helped the haying program. Briefly, from 60 acres of alfalfa, 50 goes in the silo and 10 to zero feed the milkers. By July the six acres of sudan are zero grazed.

The second and third cuttings for hay are partially used for zero grazing as needed. We usually open the fields for the mower by chopping out the piece to mow, eliminating a double windrow for haying. The sudan grass is cut again in August. During September and October all of the 60 acres are cut for green feed as third and fourth cutting. Good hay is kept before the cows the year around.

Feeding Time

Hooking up and getting the load took on the average about 20 minutes, with about 10 minutes more to pitch it to the bunks. Some delays are encountered in tall wet grass or traveling to more distant fields.

Our routine with cows starts with milking at about 5 a.m. and finishing at about 7 a.m. Grain is fed in the milking parlor. Green grass is fed at about 7:15 a.m. and within one and one-half hours they have cleaned up the grass and are lying down. About 11:00 they go to the brook for a drink and stand in the shade for a couple of hours. Then they usually come back to the feeding alley, eat hay in the hay racks, drink and lie down in shade or loafing pen.

Sarah Vaughan, explaining why she went into show business: "I wanted to get up in the world without having to get up in the morning!"

Milking starts at 4 p.m. and green grass is fed again at about 5:30 p.m. They prefer to rest

at night in a three-acre pasture. They appear very quiet and contented. The cows show good body condition.

Milk Production

I am unable to compare milk production in 1956 as influenced by zero grazing with other years, because previous years were neither full zero pasture nor conventional pasture. I might add that my herd average increased from 10,360 lbs. to 13,360 lbs. from 1955 to 1956.

The first year they were all first-calf heifers except three, and in 1956 the same cows (in 2nd lactation) of which some were culled and replaced by first-calf heifers. Fully 75% of the herd freshens from August 1 to December, thus many cows are on dry pasture part of the summer.

About two weeks before they freshen, the dry cows are brought into the milking herd where they get a grain ration containing 14% of protein. The grain to milk ratio is about 1:6 when we are feeding the green chopped grass.

A Summary

Disadvantages of zero pasture are: It is not suited to wet, clay farms that will bog down machinery in rainy weather.

It is not feasible for small herds due to higher investment of machinery per animal. In small herds the pasture area is not such a problem.

Inclement weather makes it a bit disagreeable.

Extra manure must be spread in the summer.

Advantages Are:

1. Zero grazing does lend itself well to certain well drained large farms, especially if the farm is cut up by roads or the fields are distant from the barn.
2. At least 33% more cows can be kept on the same acreage of forage. There is no waste of feed in the field under foot and from droppings.
3. Accompanying benefits include less fencing, better weed control, bloat control, and no off flavors or odors in the milk.
4. Cows come under closer observation, being closer to the barn. Hazards are kept at a minimum, such as road crossings, broken fences, and other minor troubles common to cows on the back pasture.
5. There is less hoof rot.
6. Greater uniformity and higher milk production can be made through the summer heat periods.
7. Greater flexibility of diet can be provided.
8. Chopping around a field or dividing a field into convenient

The average 200 pound hog will dress out 146 pounds of usable meat.

sections for haying eliminates the outside double windrow of hay.

9. Grain feeding as a pasture supplement in dry periods can be kept at a minimum. If cows have all the chopped grass cut at proper stage, they will not want much grain.

Conditions vary from farm to farm and a program of pasture and roughage that fit one may not work on another. In Dutchess County where good land is scarce and high prices and well adapted to alfalfa, I feel confident that a zero pasture program is most helpful for milk production.

A Farmer's Prayer

By *Samuel R. Guard,* Editor of Breeder's Gazette

Lord of the In-Gathering, Truly the Harvest is Plenteous, but the laborers are few.

In Thine everlasting providence, Thou hast brought us along from flail and treadmill and husking peg to steam, internal combustion, electricity, steel fingers, even atomic energy and automation.

Oh, we thank Thee!

We praise Thee too that we can now change work with our neighbors 'round the globe, nor have to put firebrands to the foxes' tails.

Teach us, oh Son of man, to manage these bountiful crops that we have meat to give whenever the least of these is an-hungered, thirsty, a stranger, naked, sick, in prison.

Bless our fall seedings and our fall litters, Our Father, and most of all the children born in Thine image — new souls for evermore!

Amen.

Make Labor Count in Your Dairy Business

Plan your operation to fit your farm and labor supply . . . and to figure your rate per hour . . .

Condensed from Missouri Ruralist

Arthur Edwards

IN ANY business, you find yourself in the employ of someone. This is true whether you own a factory or run a dairy farm. Sooner or later, you have the problem of figuring your wages, usually on an hourly basis.

This idea of rate of pay per hour is a good place for a dairyman to start. You're selling management, earnings from your capital investment, and some other things. But mostly you are selling your labor.

So in this article on making labor count in the dairy business, we'll use the "how much" approach. Apply it to chore time, production, income, costs. You'll find the answers give you a summary of an efficient operation which fits your farm and your labor supply.

Many of us like to handle milk cows. We like farm life, the independence and outdoor life. But we still realize we are in business. We know milking cows calls for long hours. We know the hazards of drouth, insects and disease. We also know that in this business, there are many practical and profitable opportunities. We know it's a good business with a good future.

So in looking closely at our operations, let's start by figuring how much we are going to be paid per hour, per day and per year on the setup. To answer this, we must know how much of the total income is net. How much work can we get done each hour we are on the job? How much are our cows producing? Or better yet, how much do they have to produce to pay a fair wage for our labor?

Let's start by looking at what we can expect of a good cow. Naturally, you will use your figures when you project your business. But we'll use a cow producing 8,000 pounds of 3.5 per

Reprinted by permission from Missouri Ruralist, Fayette, Missouri

cent milk per year. This cow would produce 280 pounds of butterfat. If milk sold at $3.50 per hundred, we would get $280 for milk. Normally, we'd also figure on selling $31 per year per cow of culls, young stock, bred heifers. So from a cow of this type, we'd expect a gross income of $311. This figure is the average from a group of Missouri dairymen in 1956, who have had their records analyzed.

Feed cost varies widely among dairy operations. But a good cow plus the young stock needed to keep one cow in the milking herd will eat about 50 bushels of corn or corn equivalent each year. This type cow also will need about 8 tons of hay equivalent per year. This includes hay, silage and pasture. You'll also need to add about $20 worth of protein, salt and minerals. Added up, that's about $178 per cow, which means about one-half of the gross income goes into feed.

Rental of the Cow Palace, San Francisco, used for political conventions, runs $1,000 per day.

Study the "Other" Costs

Dairymen well know there are other costs. Breeding charges or keeping a bull, veterinary, drugs, taxes, insurance, depreciation and repairs on equipment, and miscellaneous items must be considered. These may run up to $36 per cow. Added to the feed cost, you've already spent $214 of your gross income.

But there still are further costs. You have capital invested in the cow, barns and land. You also have your labor investment. Let's say the capital per cow amounts to $600, which is about average based on records. At 5 per cent interest, you charge $30 per cow. Thus, your costs per cow amount to $244. Subtract this from your $311 gross income and you have about $67 per cow left for your labor. How much an hour does this leave you for your labor? Naturally, that depends on the hours it takes to handle your cow herd. If it takes 14 ten-hour days per cow, a total of 140 hours, you're getting about 50 cents per hour. But if you can handle this same cow in 7 days, or a total of 70 hours, you're getting about $1 per hour for your labor. Thus, the number of hours worked determines your pay.

That idea is true if your cows are producing 8,000 pounds per cow. If less than this, you are not getting paid as well. If cows produce more, your pay per hour goes up.

Try New Approach

We also might approach this in a little different way. If we subtract labor income of $67 from the $311 gross, we have costs amounting to $244. Or we could

say that for each $244 costs we sell $311 of product. If we take the $31 cattle sales from the $244 costs, we have $213 costs for milk. This is a cost of $213 for 8,000 pounds of milk, or a cost of $2.66 per hundred as the cost for producing milk. The total farm costs or expenses deducted from the total sales of milk and cattle will be the net income on a dairy farm. The wages paid by this cow are not high, and are characteristic of the dairy enterprise, thus the need is great to cull cows closely and keep only the high-producing animals.

The dome of the U. S. Capitol is made of cast iron and weighs 4,456 tons.

There are several management practices which d o v e t a i l into building up efficiency. But in this check of the average dairy setup, we want to stress the labor-saving angle. So let's look at some simple facts of arithmetic.

The cow we are talking about produces 5 tons of milk per year. She and her replacements consume about 3 tons of dry hay and 15 tons of green feed. She takes a ton of bedding and produces about 10 tons of manure, 5 or 6 in the barn. She also eats about 1½ tons of grain mix. To this tonnage, add another 12½ tons of water per year to fill her drinking needs.

Totaled up, this is 40 tons of material per cow. On a 25-cow herd, that's about 1,000 tons or more per year. This big weight has to be handled. So it's easy to see how you can get bogged down in the job of carrying materials to and from the cow herd.

Efficient equipment can save much of the hand labor. The basic idea is to have the cow do much of the work herself instead of doing it for her. In the ideal system, the cow comes to the milker, the milk goes from cow to can or cooler by pipeline, the cow feeds herself in so far as possible. Grain is handled by gravity or mechanically, and the cow is guided to barns and pastures by a system of lots, gates and lanes.

Check These Points

To get this type operation takes some equipment. Look over the following points and see whether they will fit your setup:

1. Elevated platform milking barn.

Don't drive as if you own the road, drive as if you own the car.

2. Pipeline milker carrying milk from cow to can or bulk tank, preferably complete bulk tank handling.

3. Self-feeding silo, probably the lower cost horizontal type.

4. Self-feeding hay barn, prob-

ably with movable feed fence so cows literally eat their way into barn.

5. Loafing barn for cleaner cows, plus tractor front end loader for cleaning.

6. Paved lot to keep cows out of mud.

7. Grain storage which includes mechanical handling, overhead storage for dairy ration, and possible unloading grain wagon.

8. Pasture lane to all fields.

9. Open service court and cattle guards.

10. Convenient calf barn.

11. Automatic waterer providing warm water in winter.

12. A good pasture system with eight to nine months' pasture.

These improvements can cut the time of handling a milking herd in half. All may or may not pay dividends on your farm. Labor saved needs to be used for enough more production or income to pay the carrying charges on the improvements.

We're operating at a time when business management pays. Equipment which saves times on labor-short farms may release your farm labor which annually costs you more than the improvements. Some dairymen operating with near ideal setups say they have increased their wages as much as 40 to 50 cents per hour after charging off the costs.

The pronghorn antelope is able to see as far as a human aided by 8-power binoculars.

Good Sire is Needed

Improving the herd along with better feeding, management and marketing also can help you make better use of laborsaving equipment. For example, one half of the dairy cows in Missouri are still bred to scrub bulls. If you are to have a high-producing herd, you have got to have a production-bred, purebred sire as its foundation.

A comparison of DHIA records of cows across the Nation shows that artificially inseminated sired cows have produced 1,150 pounds more milk and 41 pounds more fat per year than an average of all cows. This could mean 50 cents more labor income per hour spent with the herd, if you started with an average herd.

But breeding is just a part of the story. Selection too often is assumed and done haphazardly. There is little justification for the dairyman who is going places not to participate in Dairy Herd Improvement, Owner Sampler, or Weigh-A-Day-A-Month production record keeping. With good records, it has been possible for some operators to add 100 pounds of butterfat yearly to their herd average in 2 or 3 years.

Dairymen will know the importance of feeding. Yet we need never to forget that pastures pro-

vide feed at the lowest cost. Hay or silage costs one and one half to twice as much as does pasture. And the cost of producing feed in the form of grain may run three to four times the cost of total digestible nutrients produced as pasture.

But all feed going into the dairy herd needs to be of the highest possible quality. In dairy production the lack of quality in roughage cannot be made up by a greater amount of grain or protein supplement being fed.

Early cut grasses and legumes for hay or silage may be worth one half more than these same crops cut two weeks later. In one test at the experiment station, early cut hay provided as much protein per day as late cut hay plus a pound of soybean meal, cottonseed meal, or other high protein supplements.

Plan Series of Crops

Since pastures offer the lowest cost feed, plan for succulent pasture thruout the grazing season. No one crop will do. A good plan can help greatly in establishing a cropping system which includes a series of pasture crops. In recent years, rotation grazing and green chopped feeding have been used to exceed forage supplies. Green chopped feeding can supplement grazing. Most of the summer and early fall slump in milk production is due to heat and short pastures.

The feed cost of producing 100 pounds of milk can be reduced 20 to 25 per cent by improving roughage quality and feeding more roughage and less protein and grain. Last year, this would have meant $30 to $38 more net income per cow, or 30 to 40 cents more per hour for the time spent with the dairy herd.

Any increase in price of milk increases wages. There are three ways in which dairymen can approach the question of price for their milk. One is thru organization, the various milk producers associations with the use of better bargaining power. Another is thru their support of advertising and publicity to increase use of milk.

There were just as many reckless drivers 50 years ago, but they were driving something that had more sense than they had.

Then there is the one closest to the farm which includes producing more milk during fall and winter seasons of higher demand and lower supply. Gearing production to the laws of supply and demand is just good business. From 30 to 50 cents per hundred pounds more for milk, based on a cow producing 10,000 pounds yearly with 100 hours labor, will boost wages from 30 to 50 cents per hour.

Your Check List for Culling Dairy Cattle

Here's an 18 point guide to help you find the "boarders" in your herd . . .

Condensed from Jersey Journal

Wise culling means herd improvement and greater profits. Check the following statements "yes" or "no" for the cows under consideration. If all questions are checked "yes," it indicates culling. "Yes" answers to questions 1, 2, 3, 4, 7, 8, 9, 17 and 18 are strong indications that the cow should be culled. If several cows are being considered for culling, check off each cow and compare.

		YES	NO
1.	If she is a first calf heifer, did she produce 30% below your herd average?	____	____
2.	In the first four months of her lactation has she produced less than 130 lbs. of butterfat?	____	____
3.	Is her 305-day m.e. lactation record below the average of herd mates freshening during the same year and season? (Divide the herd into two seasons of freshening—March through August and September through February.)	____	____
4.	Will she be dry six months or more?	____	____
5.	Is there a replacement heifer available?	____	____
6.	Is she an old cow?	____	____
7.	Does she have a record of mastitis?	____	____
8.	Is she positive to Bang's disease test?	____	____
9.	Does she have a record of breeding troubles?	____	____
10.	Did she have complications after last calving?	____	____
11.	Does she have a record of milk fever or Ketosis?	____	____
12.	Is space needed for fresh heifers?	____	____
13.	Is the price of beef average to good?	____	____
14.	Is she a spring freshener?	____	____
15.	Is she below the average type of your herd?	____	____
16.	Is she a slow milker?	____	____
17.	Will it pay you to replace this cow with a higher producer?	____	____
18.	Will it pay you to remove this cow without replacing her?	____	____
	Total	____	____

THE PROOF IS AT THE PAIL

What Makes an A. I. Bull ?

Want to develop a bull calf and sell it to an artificial stud? Here are the steps toward that goal . . .

Condensed from Holstein-Friesian World

Bryce Weiker,
Northern Ohio Breeding Association

THE responsibilities of the men proving bulls and of those selecting them for artificial breeding are great. Their decisions have much to do with the genetic make up of the herds of tomorrow. Any man who takes this responsibility lightly is most surely asking for eventual trouble. I sincerely hope that the young bull calf you have just brought home measures up to all tests and that we may be successful in getting him for our stud.

The first important step is already taken if you have selected the bull calf. Before getting too high on him, reconsider and re-evaluate the pedigree to see if he really has the qualities bred into him which you have such high hopes of transmitting into your herd.

Proper evaluation must be given to all phases of the pedigree. This involves research on all of the type and production records of animals and offspring of animals making up the ancestry of the youngster. Be on the lookout for common faults in several of the animals involved, they can be like a two strike count on your venture before you get started.

Growth and Care

Having checked these things thoroughly and deciding that you have a young bull with the right characteristics bred into him, your next job is to grow him out well. Proper foot care and sufficient room for exercise should be two important considerations at all times.

If he grows and develops well and looks the part, get him out to some of the local shows and have him compete in as fast company as he merits. Should he do well in the shows you will be setting the stage for advertising and pictures which are a must if interest in your bull is to be kindled.

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Extensive Early Use

Once he reaches service age get him used extensively as soon as possible to insure sufficient daughter information at an early age. If your own herd isn't large enough to allow for adequate use (40 to 60 cows in calf) interest other breeders in using him in their herds also. It is important to consider that the day of five or six daughter-dam comparisons as a basis for buying proved bulls is gone. Most studs will consider such limited numbers as preliminary information only.

Sterile parents seldom transmit this defect to their offspring.

From a health and disease standpoint it would be desirable if the bull were never allowed to serve a cow naturally. I know this is not always possible but it would eliminate one of the risks involved. It is now possible to freeze up one or two ejaculates from the bull and have it available when and where needed. Most studs are in a position to offer a custom freezing service for private breeders in their area.

Having the herd or herds enrolled in a production testing (HIR preferred) and type classification program is a necessity if one hopes to have his bull compare favorably with others which will be available.

Record the Calves

As the calves from your bull come along they should be recorded and registered. Notes on birth weights and general health and condition of calves should be filed for future reference. Abnormalities shouldn't be hidden. One may gain temporarily by keeping such things rather secret but should the bull go into extensive use it will come to light sooner or later.

Needless to say, the daughters of the bull should be grown out to the best of your ability. If they merit showing they too should be brought before the public.

The daughters of the bull should be bred to freshen at whatever age has been the established practice for your herd. It is desirable that a few of the daughters be bred back to their own sire for the purpose of checking further on the breeding qualities of the bull. It will also give a further check on abnormalities.

First Results

As the daughters come into the milking string you begin to get some answers to your questions and hopes of four years ago when you first selected the calf.

Records of production and type classification begin to accumulate and you will be in a position to again advertise so breeders everywhere can be kept informed of the job being done.

Having done all things well and being fortunate enough to end up with a string of uniformly outstanding daughters for both type and production you are now able to bargain for the sale of your bull.

You have gambled much up until this time, not only the expense of buying and caring for the bull, the advertising and showing of the bull and his offspring, but also the future replacements in your milking string. For those who end up with a quality product it is only fitting that the reward be accordingly appropriate.

The U. S. Public Health Service says: "Of all the factors of man's environment, none is more important to his welfare than food. Of all foods, none is more important than milk."

If you have done a good job of advertising your bull, most prospective buyers know something about him. A letter stating that you are interested in selling him, including a pedigree and all the production and classification information available will usually start us or any other stud to making further investigations.

What We Look For

In selecting proven bulls for our stud we search for those who transmit profitable production and outstanding breed type, have a sound, substantial pedigree, and some popularity or appeal. Priority to these points should be given in the order mentioned.

We use quite extensively and are grateful for the breed improvement practices of our National Holstein Association as guides for selecting proven bulls.

Our first step after deciding to consider a bull is to secure from our breed office a list of the daughters of the bull. This list shows name, registry number, date of birth and owner of each animal. From this listing we are able to account for all the daughters and whenever possible make a personal inspection. This listing gives us a clue to the amount and reasons for culling that has been done.

Production

When analyzing the production information on the daughters of a bull we want to use all the records of the daughters and their dams along with the herd averages for the period of time during which these records were made. Once these records are assembled it is possible to make several comparisons. The daughters and the dams can be compared on a current basis, similar age records can be compared for both and the daughters can be compared with the herd. All these cross checks are an aid in trying to properly evaluate the influence of breeding and management.

The ideal situation would be for the daughters and dams to be raised and milked in several herds where management and feeding conditions had been constant. If freshenings for daughters and their dams had been at the same time of year and everything else had been constant we could probably attribute any changes in production levels to the influence of the bull in question.

Such a situation seldom, if ever, presents itself so we have to make allowances and assign values accordingly.

Outstanding milk production with at least breed average test are the things wanted most in bulls for artificial stud use. As long as Mature Equivalent factors are used and published by our National Association they will be our yardstick or guide.

We are always striving to select bulls whose daughters have demonstrated their ability to exceed breed average by a considerable margin.

The perils of quick maturing cows with terrific two and three-year-old production being given too much preference over the slower developing but constantly improving kind must always be a consideration when making the analysis. All of us have been guilty of leading dairymen to expect something like 500 pound butterfat production from heifers with the resultant sacrifice in use of some bulls whose daughters were a little slower to develop.

Type and Milking Qualities

Breed type comparisons are somewhat easier to make if the herd has been on a regular routine classification program. This is particularly valuable in making comparisons on a breakdown basis at corresponding ages. This must also be aided and abetted by personal inspection and evaluation. Cows do change and such changes must be given proper valuation.

In all cases we are interested in obtaining a bull who sires uniformly outstanding breed type. The lowest scoring breakdowns for our breed as a whole are in the mammary system and legs and feet, so a bull who has demonstrated his ability to transmit uniform improvement in these categories is desirable. This cannot be the only basis for selection as all other characteristics must be in balance.

The National Association has arrived at some breed average figures for each breakdown at various age levels and these are quite helpful when evaluating the job being done by a bull.

About 10 quarts of milk are required to make 1 pound of butter or 1 quart of ice cream.

General characteristics such as ease of milking, quickness of milk-

out, nervous tendencies, willingness and ability to get their share of feed must also be given serious evaluation.

The type of the bull as an individual must also be given some consideration in this business as it is pretty difficult to conceive of very many people using a bull extensively in their herd if he lacks a high per cent of true Breed Type. All other things being equal the preference will always be for the high scoring individual.

Pedigree and Line of Breeding

Pedigrees and bloodlines are important considerations to purebred breeders. All of them are good and it is our aim to maintain a balanced battery of bulls with tops from all lines available. Now that frozen semen is being used we are no longer dealing with a perishable product. It is possible for dairymen to breed to the bull of their choice at any time.

The advertising and "romancing" done for a bull prior to and after his proving must also be given some consideration. This may mean little in so far as his worth as a breed improver is concerned but it will most surely be reflected in his use and acceptance. Continued use and promotion of a bull after his sale for artificial breeding is quite desirable as it adds emphasis to the appreciation of the bull by the man who developed him and the ones now using him.

New Water Bowls for Dairy Barn Are Safer

Think twice before you buy any more old type water bowls for your dairy barn. If the water inlet is below water level, the bowl can "back-siphon" and may contaminate the farm water supply.

University of Wisconsin agricultural engineers explain what farmers with old-type drinking cups can do to prevent back-siphoning. This includes such things as gravity-fed water tank, conversion of old bowls, or installation of special valves or additional pipes.

There's no chance of contamination with the new bowl, the engineers explain. The water inlet is high. Since it isn't covered by water, there's no danger of the cows' drinking water back-siphoning into the farm water system.

The new bowls are necessary for grade A approval of new installations. They're also ideal for replacements and cost a bit less than old type bowls. —*University of Wisconsin*

What Bedding Is Best for Dairy Cattle?

Researchers tested and scored six popular bedding materials. Here are the results . . .

Condensed from Iowa Farm Science

C. F. Foreman and A. R. Porter, Iowa State College

TYPES of bedding materials available for dairy herds have changed in recent years. Changes in methods of harvesting small grains and in the acreages of small grains planted have resulted in less straw being available for bedding material. And many other materials are being used as bedding for dairy cattle.

Several states report studies showing that wheat and oat straw are still the cheapest bedding for areas where small grains are grown. But wood shavings, ground or crushed corncobs, chopped or shredded cornstalks, wood chips and rubber mats have also been reported as useful bedding materials where straw is scarce.

Cows can be kept clean and high-quality milk can be produced on any of these materials—though there's some disagreement as to comfort. There is, too, a large difference in the cost per stall per day for different bedding. And some materials may not be available in certain areas of the country regardless of cost.

How practical are these new bedding materials? We compared some of the materials available in Iowa to learn their usefulness for dairy herds.

What We Did:

Using conventional tie stalls, we studied six types of bedding materials, with three cows assigned to each material. The materials studied were oat straw, wood shavings, sawdust, ground corncobs, cornhusks and wood chips. We compared: (1) pounds of bedding used per stall per day, (2) how well the bedding stayed on the stall platform, (3) cleanliness of cows, (4) absorptive ability of each type of bedding, (5) ease of handling the materials and (6) health and apparent comfort of the cows.

We also compared the use of some of these materials under loose-housing conditions—particularly with respect to handling and the use of some materials as

Reprinted from Iowa Farm Science, published by Iowa State College, Ames, Iowa

a base for other types of bedding. We compared the use of straw, wood shavings, ground and whole corncobs and wood chips as bedding materials under loose-housing conditions.

Our Results:

There was a small difference in the cleanliness of the cows on various materials. But the cows kept reasonably clean with all of the bedding materials used. Wood shavings, sawdust and corncobs were much more absorptive than oat straw or cornhusks and somewhat more absorptive than the wood chips and shaving mixture.

We found a marked difference between materials in the pounds of bedding needed per stall per day and in the amount of bedding retained on the stall. Oat straw seemed to have an advantage here. Actually, a higher percentage of the original straw bedding had to be replaced daily than did any of the other materials except wood chips and cornhusks. It was difficult to keep the cows properly bedded with cornhusks.

From the standpoint of ease of handling the materials, wood shavings, sawdust and wood chips were easy and pleasant to handle. And oat straw and corncobs were somewhat easier to handle than cornhusks.

The cattle seemed comfortable on all types of bedding materials except corncobs. Two of the three cows on cobs were obviously uncomfortable and showed some lameness after 2 or 3 days. One lame cow was removed and replaced and the cows on cobs were switched with those on sawdust. The cow that had been tender-footed on the cobs was soon walking normally after going on sawdust. None of the cows switched from sawdust to cobs showed any lameness, though they seemed to want to stand in the gutter rather than on the stall platform.

While the cows on wood chips didn't appear uncomfortable, they did scrape more of the bedding off the platform into the gutter than did cows on any of the other materials. This was probably because the chips were light and more easily scattered.

In addition to the lameness of the cows on cobs, there were some minor injuries in each group of cows. All were cases of hocks becoming rough, raw hocks or some puffiness of hocks.

For Loose Housing:

In loose-housing, oat straw and wood shavings are known to be satisfactory bedding materials. We tried using whole cobs and wood chips as bases for straw and shavings in bedding yearling heifers. The wood chips give a firmer bed for straw or shavings early in the fall, and the heifers seemed to prefer lying down on the chips rather than on the cobs. The cobs tended to roll out some from the front of the shed before the bed-

ding piled up. However, they provided a cleaner bed for the heifers before a pack of straw or shavings and manure had been established.

After the manure pack was established, there were no differences in the cleanliness or comfort of the heifers where either cobs or chips were used as a base for straw bedding. The use of cobs or chips as a base made it easier to clean out the shed than where shavings or straw had been used directly on top of the ground. Also, more of the liquid portion of the manure was saved when a base was used.

An African elephant, de spite its weight, can run as fast as twenty-five miles an hour. A rhinoceros or giraffe can do about thirty miles an hour.

Ground corncobs performed somewhat better than whole corncobs in another loose-housing test. The ground cobs provided a firmer base during the early fall than did the whole cobs.

Things to Consider:

Though there's some difference from the standpoint of cleanliness, bedding requirements and ease of handling the various materials can be used satisfactorily.

Probably the most important factors are the availability and cost of the materials.

Where sawdust is available, it will make a satisfactory bedding. Cornhusks are also satisfactory, though they're somewhat harder to handle than the other materials. Because of the additional expense of obtaining wood chips, the need for grinding corncobs and the apparent discomfort of the cows, these two materials are probably the least desirable of those we studied.

Radio Waves "Crack" Hard Seeds

Radio waves have been put to work to help farmers.

Washington State College scientists have been using high frequency radio waves to "crack" seeds that won't germinate. They have been working with alfalfa seeds.

Alfalfa seed growers have had trouble because some of their seed is "hard" seed—won't germinate properly. The two scientists have been able to increase the germination of hard seed from 60 to 96 per cent. They have done this by exposing the seed to high frequency energy for 25 seconds. —*State College of Washington*

Penicillin Promises Bloat Control

The famous drug has done an excellent job in extensive tests and with no apparent bad after effects . . .

Condensed from Research and Farming

BLOAT is causing an estimated loss of $40 million a year in the United States. The question of what to do to prevent death of cattle grazing on clover and alfalfa has not been answered fully yet, but penicillin is beginning to look like a good bet for bloat control.

Various theories have been advanced on the cause and control of bloat. One that held forth for many years was that the stomach had to be scratched with coarse material to make the animal belch and get rid of bloat-causing gasses.

This "tickle theory" is the basis for feeding coarse hay and straw to animals on bloating forage. Yet, many grasses do no more scratching than clovers and bloat is no problem on pure stands of grass.

Chemicals May Be Responsible

The current popular theory is that chemicals in clover and alfalfa and in saliva cause foaming or frothing.

Bacteria in the paunch produce gasses as they help the animal use coarse materials through fermentation. Not only do they break down feed, but they also make vitamins and other nutrients needed by the animal.

Experiments have shown that no more gas is produced on a pasture that bloats than on one that does not. It's a matter of getting rid of the gas that makes the difference.

Frothing may occur because an animal eats too much too fast. Feeding animals before turning them on bloating pastures is often thought to help prevent bloat. This is not due to the "tickling"

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of the dry feeds. Rather they dilute the frothy pasture and keep the animal from eating enough of the bloating forage to cause trouble.

Antibiotics Are Tested

Mississippi workers gave Aureomycin, Terramycin, Bacitracin, Streptomycin and Penicillin orally to steers in 1955. Only penicillin helped prevent bloat when used at low levels.

In the spring of 1956, we studied penicillin along with antifoaming agents, using fistulated cows (window into stomach) on bloating fields. Half of a normal herd and half of the fistulated cows got the penicillin.

Reputation is what folks think you are. Personality is what you seem to be. Character is what you are.

After grazing at least 12 hours, the fistulated cows that did not get penicillin were very frothy. When the caps were removed several gallons of ingesto (frothy mass) weighing less than a half pound per pint would gush forth. However, samples from stomachs of cows getting 100 milligrams of procaine penicillin weighed about a pound per pint and there was no running over when the cap was removed from the fistula. The gas did not build up in the cows getting penicillin.

Normal animals getting the 100-milligram dose of penicillin at least 12 hours before going on pasture did not bloat for up to three days. Larger doses were not effective for longer periods. Untreated animals in the same herd continued to bloat.

How To Give The Penicillin?

Penicillin can be given as a drench, in tanks of water, in the feed and mixed with salt. Individual drenching is the only sure way to get an exact dosage. However, adding about one gram of procaine penicillin to one pound of salt fed free choice looks promising.

Mississippi workers found in 1956 that a penicillin-salt mixture (50 mg. per ounce) gave good bloat control by the third day. They fed the mixture to some 3,000 cows, steers and heifers on 19 farms that were having trouble with bloat.

Since the bacteria are beneficial in the rumen it's questionable how much penicillin can be fed without harmful effects to the bacteria.

Preliminary studies with sheep fed daily doses equal to that required to stop bloat in cattle showed no obvious harmful effects. The sheep continued to graze and appeared normal with no influence on body weight.

Additional studies will help determine the best way to get the proper dose into the animal.

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VEGETABLES, HORTICULTURE

Vegetable Production and Marketing. Work & Carew. 2nd Edition. 1955. 537 pages. (Source 6) $4.72
Practical Horticulture. Shoemaker & Teskey. 1955. 374 pages. (Source 6) $4.20

FARM SANITATION

Rural Water Supply and Sanitation. Wright. 2nd Edition. 1956. Approximately 358 pages. (Source 6). Probably $4.90

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The Grain Trade: How It Works. James S. Shonberg, Uhlmann Grain Co. A comprehensive treatment by a man who should know the grain market. (Source 1) ..$6.00
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VETERINARY

Livestock Health Encyclopedia. Seiden. 624 pages. 300 Illus. 1951. (Source 5) $7.50

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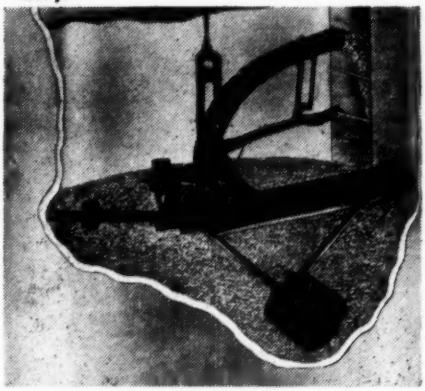

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